SUPPLEMENT.

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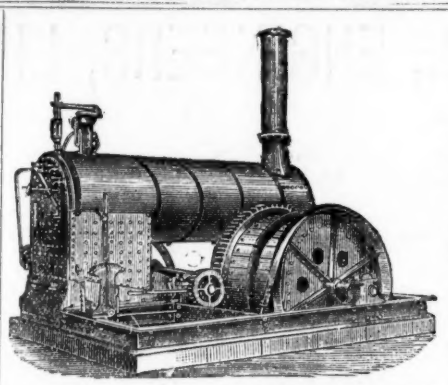

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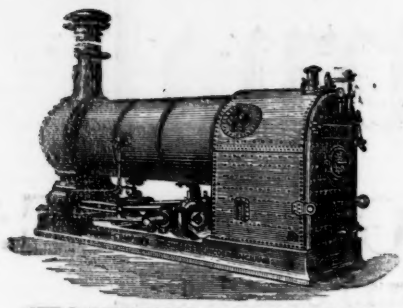

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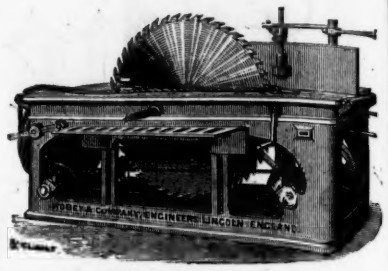

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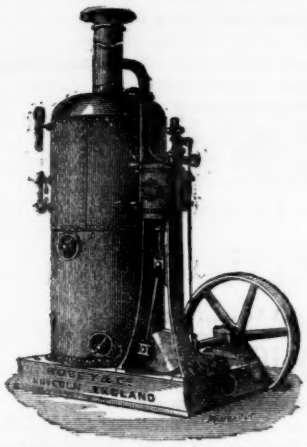

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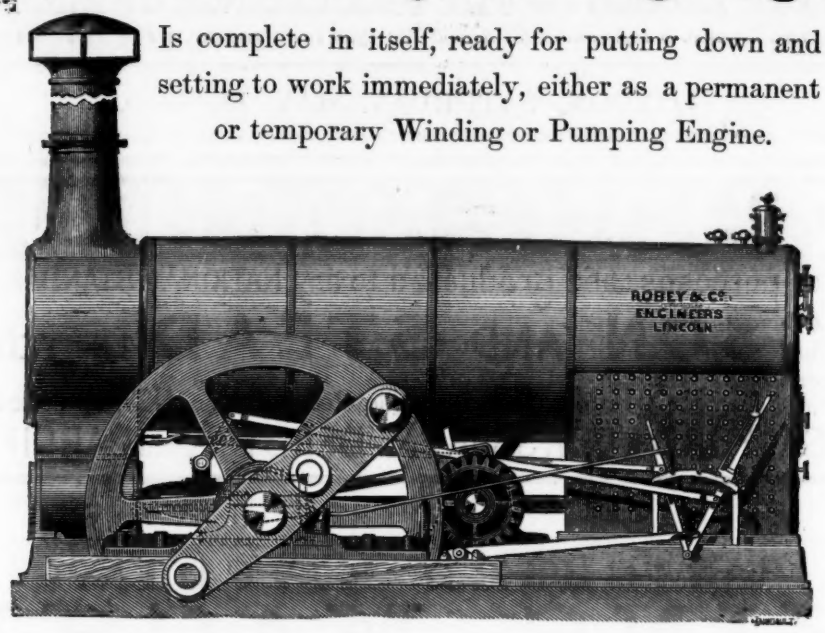

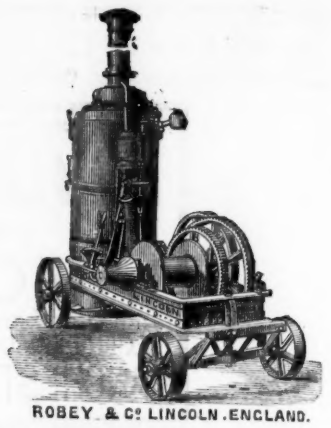

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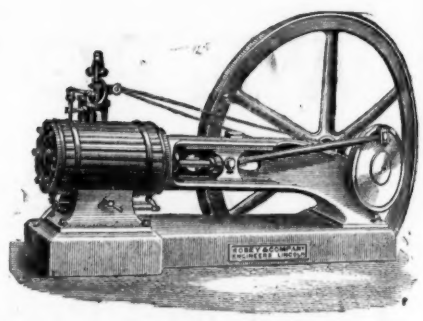

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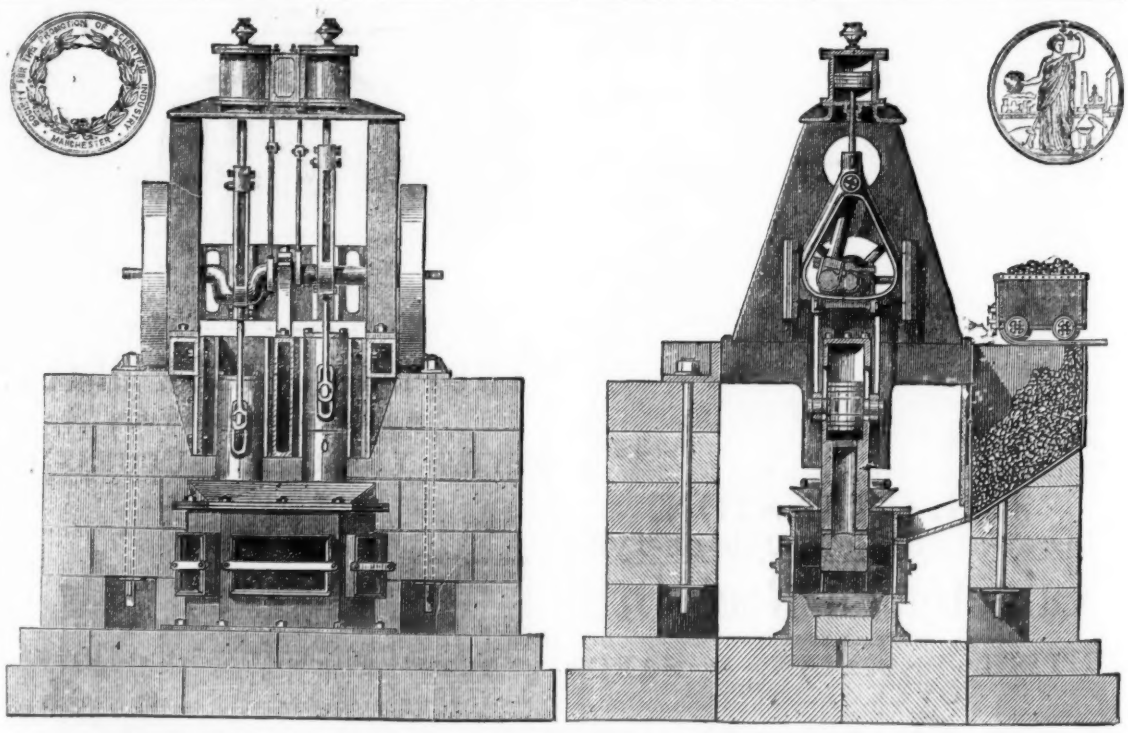

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Original Correspondence.

ON BOILER EXPLOSIONS—No. II.

SIR,—To those who are owners to a greater or less extent of boilers for the production of steam the yearly reports of the boiler inspection and insurance companies must be of increasing interest. So many valuable suggestions are embodied in these reports that a careful perusal of them will not fail to give information of most useful and practical form to users of steam, which may be applied both in preventing any deterioration of boilers arising from unskilful usage, and in averting such calamities as boiler explosions. The writer once suggested a simultaneous inspection of every coal mine in the United Kingdom, for the purpose of bringing to light any instances where proper systems and arrangements were not in force for preventing explosions or other accidents. Similarly, it has been said that if all the boilers in operation in the United Kingdom could be inspected to-morrow some startling discoveries would be made. It is, no doubt, an argument in favour of Government inspection when many owners seem so indifferent to the lives of workmen they employ, and run the risks we often hear of, that the boilers they use should be subject to examination by independent persons. It is not desirable that Government should interfere in these matters to too great an extent; but most engineers of the boiler companies agree in this that every boiler should be registered, and that it should be subject to inspection at certain periods—the owner having the right of choosing an inspector either in one of the existing companies, or of an authorised engineer, with a sufficient staff of assistants.

The Boiler Insurance and Steam-power Company has been established 21 years, and has at the present time a greater number of boilers under its supervision than is possessed by all the other companies joined together. The object of this company is to secure, as far as practicable, the safety of boilers and economy of working. This is effected by efficient inspection, not only at periodical intervals, but at any other time when necessary. The chief engineer of this company, Mr. McDougall, while giving the usual information regarding its transactions and particulars of explosions that have occurred during the year 1879, renders his report of still more practical value and interest by furnishing drawings and description of a Lancashire boiler—one of the most approved boilers in modern practice. It is intended, also, in future years to give particulars of other types of boilers and engines, which from the vast experience of this company and its opportunities of discriminating between the various forms in practice they can advise for adoption. The Lancashire boiler referred to is designed to work at 80 lbs. pressure, and the information given will be of service in making a contract with any boiler-maker for a construction of this kind. The working pressure is designed to be 80 lbs.; internal length, 28 ft.; diameter, 7 ft. If made of iron the circular plates to be $\frac{1}{2}$ in., and end plates $\frac{5}{8}$ in. thickness. If made of steel the circular plates $\frac{3}{8}$ in. full, and end plates $\frac{1}{2}$ in. thickness. The two flues to be 2 ft. 9 in. internal diameter, tapering at the front end to 2 ft 5 in., and at back end to 2 ft. 2 in. diameter; thickness of plates, $\frac{3}{8}$ in. The furnace-plates to be of high-class steel or Yorkshire iron. Grate surface, 33 square feet; heating surface of furnaces and internal flues, 450 square feet; of external flues, 350 square feet: total, 800 square feet. The report goes on to state that the extensive adoption of the Lancashire boiler in the United Kingdom has been attributed to the influence of this and other inspection societies having their head-quarters in Manchester; but it is thought the fact is due to its superior economy, both in respect of fuel and space occupied.

In the London and other districts, where fuel and space are economised as much as possible, and in cases where good water can be obtained, the locomotive, marine, and other compact types of boilers are used with advantage. The introduction of the surface condenser, so generally used in connection with marine boilers, is now being adopted for land engines, making steam users in a measure independent of pure water for feeding boilers. The drawings referred to show six cross tubes fitted in each flue, and arranged so as to give space for a man to pass through the flues for the purpose of examination or repairs. While the flues are thus greatly strengthened a better circulation of water is also ensured. In some boilers these tubes are welded to the flues; if arranged in this way the flues are more difficult to repair, and in the case given the tubes are rivetted in.

The principal difficulty in the use of the Lancashire boiler arises from the expansion of the flues, which is provided against in various ways by different makers. The higher temperature of the top side of the flue, which occurs in a greater degree where non-conducting material settles upon the plates, leads to arching or hogging of the flue from lengthening of its upper side, the result being a gradual fracture of the circular seams of the flues or grooving of the plates at the ends. The Bowling ring or the flanged seam may each act as expansion joints. If these answered their purpose the furrowing or grooving of the end plates should be prevented. The Bowling ring, as now made of steel, from 5-16 in. to $\frac{3}{8}$ in. thick, may be depended upon in its action; but the flanged seam is not always so efficient, especially when the feed water is bad or the combustion is too much forced. An instance is given of a Lancashire boiler, erected in 1875. When examined by one of the inspectors in September last it was found in a very dirty condition, not having been cleaned for several months. The water being bad, extensive grooving had taken place in the end plates. The flues were made with a flanged seam at each joint; the front end plate was grooved completely through over the right furnace for a length of 10 in., the grooving being continued nearly through about one-third the perimeter of the flue. The other parts of the end plates at the left furnace and at the back end were in nearly as bad condition. From careful observation of a number of cases of similar bad treatment it is evident that, whether the flue be plain or provided with T-iron hoops, Bowling rings, or flanged seams, some elasticity of the end plates is most essential to the endurance and safety of the boiler. The practice of some makers of tapering the flues towards the ends, to allow more "breathing" space, is well worthy of adoption, especially where the feed-water creates difficulties.

The modification of the Lancashire boiler known as the "Galloway" boiler is constructed with the two furnaces to unite into a large combustion chamber, in which are fixed vertical water-tubes. The great efficiency of this boiler is in part due to the heat imparted by the water-tubes, and to the rapid circulation from the lower part of the boiler.

In the setting and mounting of boilers it is desirable to keep in view the following points. External flues should be of sufficient size to admit of examination and cleaning; the flue should not allow the heated gases to rise above water-level. The boiler should not be set on a mid-feather wall, but on two side walls, not more than 4½ in. wide at the part in contact with the shell. The products of combustion after passing through the internal flues should pass along the bottom flue and afterwards the side flues.

The blow-off cock should be left properly closed. A great number of internal flues are said to collapse every year from shortness of water, occasioned by not carefully closing the blow-off cock.

The feed-pipe must be placed so as to deliver water horizontally about 2 in. above the level of the furnace crowns, between the flue and shell in Cornish and Lancashire boilers; in the case of marine or multitubular stationary boilers the water should be delivered 2 in. above the top of the combustion chamber or fire-box. In plain cylinder boilers the orifice of the feed-pipe should be 6 in. or 7 in. below ordinary water-level.

Fusible plugs and good low-water safety-valves should be provided. Safety-valves should be loaded to the required working pressure by means of one weight only; the use of a multiplicity of weight facilitates overloading.

A pressure-gauge is provided for each boiler; in all cases the gauges should be fitted with cocks, to allow of the gauge being tested, by shutting off from the boiler and opening it to the atmosphere.

A notice of this company's operations during the past year may be briefly stated. The number of boilers inspected is about 23,000. Only one of these has exploded during the year; 44,173 visits were made to firms or owners of boilers, and 80,457 examinations of boilers. Of these 69,189 were ordinary examinations, 990 internal examinations, and 10,278 thorough examinations: 1974 boilers have been accepted for insurance during 1879, and 58 declined, for the following reasons:—

16—Defective condition of the boilers, or insufficient mountings.
8—Faulty construction, or unfitness for required pressure.
24—Opportunity not afforded for thorough examination.
2—Opportunity not afforded for hydrostatic test.
2—Permission refused to inspect.
1—Mode of feeding objectionable.
5—Not accessible to the inspectors.

The principal defects discovered by this company's inspectors during the year are as follows, a report of each case having been forwarded to the owner:—

Corrosion of plates and angle irons	1915
Fracture of ditto ditto	508
Safety-valves overloaded, or out of order	1653
Pressure-gauges out of order	838
Water-gauges out of order, or fixed too low	367
Boilers damaged by overheating, owing to deficiency of water..	55
ditto ditto accumulation of deposit..	18

No doubt serious accidents have been prevented by the timely warnings given to owners amongst this great number of cases.

The following are some of the more prominent defects discovered by inspection in 1879:—

CORROSION.—1. Plain cylinder boiler, 20 ft. by 4½ ft., $\frac{8}{8}$ in. plates, 40 lbs. working pressure. A portion of one of the seating walls, much too broad, being removed three of the plates were found corroded to the thickness of paper, owing to leakage from the seams.—2. Lancashire boiler, 22 ft. by 6 ft. 10 in., $\frac{7}{8}$ in. plates, 19 years old, 45 lbs. working pressure. The boiler-house roof not having provision for carrying off rain water this has run down on the brickwork enclosing the boiler, and kept it in a damp state. On removing the brickwork the plates were found to be corroded almost through, for 5 ft. 6 in. in length. Of the safety-valves found out of order 29 were altogether inoperative, and some were overloaded as much as 20 lbs. to 30 lbs., by means of extra weights.

PRESSURE-GAUGES.—Some gauges indicated as much as 21 lbs. to 35 lbs. less than the actual pressure. If the load on the safety-valve is adjusted by the gauge a great risk is incurred in not keeping it in order.

WATER-GAUGES.—Several water-gauges found out of order; 47 were fixed too low. There would still be water shown in the gauges when the furnace crowns were not covered with water. M. E.

IMPROVED METAL TUBES.

SIR,—I think I have seen it several times stated in the *Mining Journal* that one of the principal obstacles to the introduction of endless chain pumps for mining purposes was the great cost of iron tubes of uniform diameter throughout; and if this be so I believe I can safely say that that obstacle has now been removed, for by the invention of Messrs. Stewart and Wotherspoon, of Coatbridge, thoroughly reliable and uniform tubes can be produced very cheaply. The draw bench and the carriage upon which it moves are specially constructed. The carriage is provided with a horn, which projects from its side inwards to the centre of the carriage. To the inner end of this horn a chain is attached, which by virtue of the position of the point of attachment secures a central pull on the carriage as it is traversed upon the bench. The upper part of the bench is formed with a V or equivalently shaped groove for facilitating the manipulation of the tube in the course of its manufacture. The motion of the chain is not continuous, but is under the control of the operator, and when the tube is drawn through the die or welding matrix, it is by the reversing of the motion of the carriage run at great speed back into the furnace for the subsequent heat or heats required until the manufacture is completed. This motion may be given to the carriage by screw or other reversing gear from a motive power engine directly actuating chains, ropes, or belts, or by hydraulic pressure or other mechanically equivalent arrangement. When using a hydraulic cylinder this might not require a regulator, as the speed could then be regulated by a stop valve; this cylinder may either be the full length of the tube to be drawn, with the tube fixed on the end of the piston-rod, or the travel may be increased by the employment of multiplying pulleys and chains, ropes, or bands, as hereinafter set forth with reference to driving the apparatus by steam, or an endless chain may be used driven by reversing gear. By preference, however, they use steam for driving the apparatus, the steam being generated by the exhaust heat of the welding furnace.

According to the improved arrangement which they adopt they place a cylinder of any convenient length under the draw bench provided with a piston and piston-rod, which piston-rod projects and passes through each end of the cylinder cover. To each end of the piston-rod, which works in guides, they attach one or more pulleys as may be required for the length of the draw bench, and after leading the chain over these pulleys and the pulleys at each end of the bench, one end of each chain is fastened to the bench, the other end to the carriage. By this means, as the piston is moved, the carriage of the draw bench is made to travel the requisite distance. For the purpose of controlling the speed of the bench they place a cylinder filled with water or oil parallel to or in any suitable position relatively with the steam cylinder, and attach the piston of this cylinder to the piston of the steam cylinder by a chain which passes round a horizontal pulley at each end of the draw bench. By a valve or valves they regulate the flow of the water or oil from one end of the cylinder to the other, and thus regulate the speed of the steam piston, which can thus be made to travel rapidly in one direction and slowly in the other, thus giving control of the speeds. By means of a lever which actuates the slide valve the piston is brought to a state of rest after the carriage travels to the end of the bench, where it remains until the piston is started in the opposite direction. In operating with this improved bench they by preference weld the whole length of the tube at the same time, and to do this they first weld a rod or porter on one end of the hoop, or on the "skelp," but by preference on the hoop, and when the hoop is heated the rod is attached to the carriage and drawn through the bending die. The piston is then reversed, thereby running the tube into the furnace, and a second and following dies are passed over the rod, and the tube drawn through again until it is of the proper size and finish.—*Glasgow, May* 10. DONALD.

CHILI COPPER CHARTERS.

SIR,—Permit me to call your attention to an error in last week's Journal. Under the heading Copper, page 516, it is said, "Upon the announcement last Monday of the charters as 3600 tons for the first fortnight of *this* month the market opened exceedingly dull." This should be the charters of the *last three weeks* in April. Perhaps you will kindly rectify this in your next impression, and oblige—

Cannon-street, May 10. A CONSTANT READER.

HALF-FORMED PUBLIC COMPANIES.

SIR,—Among your many obliging correspondents, ever ready to give information when asked for through your columns, I hope to find one who will give me some as to the Nava de Jadraque Gold Mine of Spain, advertised in May last year in the *Mining Journal*, and which the prospectus declared to be sure to pay enormous dividends—even one share would give a good income; with such reserves exposed, and ore at pit's mouth, &c., how is it nothing is known or heard of the mine to either the public or the shareholders? And why is it, if any meeting has been held, or any information received as to the property, it is not at once forwarded to the shareholders or published in the Journal? Perhaps some well-informed shareholders will give such information to a fellow-shareholder who has been favoured with but little information as to his property since he subscribed for some shares. Some letters in the *Mining Journal* have suggested an idea of establishing a sort of "Enquiry Office" where, on payment of a certain fee, all enquirers may receive information as to any property they may wish to invest in. The names of those furnishing the information need not be known, and enquirers will be sure that the information is valuable and trustworthy, and as correct as human skill can make it. I think it would be the means of improving the morality of the mining market, and of saving much money if not altogether checking the growth of these semi-formed companies which seem to be starting up in every direction since the law, or rather those connected with the law, have plainly established the fact that the practice of alloting shares before the entire capital is subscribed is not punishable. SHAREHOLDER.

THE INDIAN GRANGE GOLD MINING COMPANY.

SIR,—A paragraph appeared in the Telegraph the other day stating that Major-General Gallwey had resigned the directorship on the board of this company. As many shareholders, I have no doubt, were induced to subscribe for shares in this company on the undoubted assurance of the General's name and status, it would have been better had he, as a man of honour, stated his reasons for so doing, and not to have allowed the same to ooze out as it has done. It is said, amongst other things, that the General's principal reason for so doing was that not sufficient capital had been subscribed for, and he considered it would have been better to have returned the deposits. The incidences of the description of the property, so much noticed and commented on by leading sharebrokers in the City, may have to be settled by a court of law, and if erroneous the directors may be called upon to substantiate what has been put forward in the prospectus, and on which subscriptions were sought for from the public for shares in the company. Shareholders will do well, in the meantime, to consider their position in the company. It has also been said that several shareholders have received back their deposits at a reduction of 10 per cent. It is considered, however, that the directors have no right to make this reduction. The deposits should have been returned in full. B. C.

BRAZILIAN GOLD MINES.

SIR,—In reply to your correspondent of last week, signed "A Shareholder," I beg to inform him that I was not present when Mr. Richards reported on the above, but I may tell him this, "that experienced gentlemen spoke in the highest terms of the Brazilian Gold Mines (Limited);" and I learned through my friends who were present that they were very much pleased by his opinions. I should be very pleased indeed to tell him ("A Shareholder") what took place there, but as I presume it was a private meeting I prefer not doing so. However, there can be no doubt but that we have a valuable property, and ought to be satisfied at our prospects, more especially the "board of directors." It is sufficient to remember that Capt. Cuerra, a Portuguese, and his family, when first there were very poor, and after became very rich; and Captain Quintiliano lived there 69 years independently, having no other resource but that of the mines.

It is said that the owners declined to part with the property except at fabulous prices, and also "that an attack was made on the Descuberto Mine by armed gold hunters by the rumours of a rich discovery of gold, and assembled in such numbers that there was warfare among themselves, from which many deaths occurred;" but after the death of Capt. Quintiliano the mine got into difficulties, and has not since been worked. If we bury a sovereign, and after a number of years proceed to dig it up we, of course, expect to find it again; so it is with these veins. They were once worked and found very rich, but through bad management fell together, and so remain to the present, and when opened out again we must expect to find the same rich veins of ore.—*London, May* 12. B. H.

TECOMA SILVER MINING COMPANY.

SIR,—What is being done with this property? With the low price of lead in the United States for several years past it can be understood why the working of the mines was suspended, but as lead has advanced from 3 cents to 6½ cents per pound these mines should not be allowed to remain idle, as it is generally known in Utah that they are capable of producing large quantities of ore, hitherto low in grade for silver, but very easy to smelt; very rich ore has been occasionally met with, and in course of development it is fair to anticipate that other rich deposits may be met with. In the good times of 1872 the shallow workings of the American Tecoma Mine yielded many thousands of tons of ore, which were converted into bullion by Messrs. Aspinwall, of New York. This ore was not so high in grade as that of the English Tecoma Mines, but it is reported that the working of these mines is to be resumed, the capital being again provided by New York capitalists. A MINER.

TECOMA SILVER MINING COMPANY

SIR,—I notice in your correspondence in last week's Journal some remarks in reference to this unfortunate company, and I am quite of opinion that the mine is a very valuable one, and am only astonished that it has been allowed to remain dormant for so long a time. Large quantities of ore have been taken from it and sold at times when the market for ore was hardly one-half as good as it is now; and with the present low rate of wages, provisions, &c., I think there can be but little doubt about the mine paying handsomely when further developed. The great champion lode, or "Madre," has never yet been reached by the adits driven to intersect it, but if surface appearances go for anything there must be hidden beneath this great backbone plenty of ore to reward the explorers. The company is, I believe, out of debt to outsiders, and it does seem a pity that some steps are not taken to effect a re-organisation. Although a great deal too much money was paid for the mines it would be returned to the shareholders with large profits if one or two good ore bodies are met with such as have been discovered in Flagstaff and Richmond. In the upper workings of the former the lode has not such a favourable appearance as was presented in Tecoma, and I firmly believe that skilful and steady exploration alone is needed to bring the Tecoma Mines into profitable condition. N. M. M.

FLAGSTAFF SILVER MINING COMPANY OF UTAH.

SIR,—I had occasion some time ago to remark that one tale may appear true until another is told, and that until you hear both sides of a question it is unwise to form an opinion, and I must here remark on the one-sided tone of both the letters signed "A Large Shareholder," and T. J. Buse, which appeared in your valuable Journal of last Saturday. The former letter savours very much of a "bull" of the shares, and the writer is evidently annoyed at the shares fast falling to their real value. Your correspondent states that "I would just point out that his (Mr. Pearson's) or anyone else's title will be found to be very defective, unless the interests of the share and debenture holders are properly cared for." Now, what have the share and debenture holders to do with the title to the property? At one time, and that not many weeks ago, I was assured it was necessary to obtain the consent of the company in order to obtain a valid title, but I have since ascertained that the company has no power in the premises, and that as I stated in my circular letter of the 5th inst., the company is in reality "bereft of all." I have the letters of Mr. Beatty, the company's attorney in Salt Lake, to prove this. He says, "The title to all the property the company ever had is vested in the assignees of the judgment creditors." There is no fear of lawsuits, but I believe that the new company will be a great success. What it would be with the obligations of the present company tacked on to it is very doubtful, but I am advised they would be fatal to its success.

The letter itself, signed J. Buse, requires little reply, and there is only one expression that needs any reference, and that is that he shall "thank all share and debenture holders to co-operate with him, and thus prevent their property from being sacrificed." Mr. Buse has had little opportunity of informing himself of the company's affairs. In the postscript of his letter this new comer arrogates to himself the right to censure my conduct, but I shall leave his presumptious strictures to the judgment of the shareholders, who, I have no doubt, will exonerate me from blame.

Certainly my circular was issued without the consent of the directors, but I gave them timely intimation of my intention. The circumstances demanded the sacrifice of my position, and when I resolved on issuing the circular I, of course, resolved at the same time on terminating my connection with the directors. After receiving my resignation they indulged in the spiteful step of voting my dismissal. For the sake of giving the shareholders the information so long due and so unjustly withheld from them, I was prepared for the consequences of going against the wishes of the directors. I urged upon the chairman as far back as July last the obligation of informing the shareholders the result of the decision in the Tarbet case, by

which the company's title on the lode was restricted to 100 ft. The representation in the directors' recent circular that the case can be reheard is not warranted by the letters of Mr. Beatty, to which they refer in support of their statement. These letters report that the case of the company was fully and fairly stated and argued, and he expressed a very decided opinion that the decision was conclusive. Certain it is that ever since that decision was reported here the directors took no steps to obtain a reversal of this fatal judgment. So far from a reversal of this decision being followed by repossession by the company, the effect would be the confirmation of the holding of the lode in the hands of the judgment creditors.

The syndicate has not met with the success claimed for it by the directors' circular, which admits that only one-half the amount subscribed has been paid up. I attribute that to the discovery on their part of the impossibility of giving a high value to the shares of the present Moribund Company, and to their recovery from the delusion that a successful company could be formed which would give a "liberal recognition" in a new company.

I quite agree with you, Mr. Editor, that the new company could not possibly give the Flagstaff shareholders any pecuniary advantage over other subscribers, and in order to make the new company a success, and so prevent by all means litigation, it must be entirely free from the liabilities and obligations of the present concern. The preferential offer simply means that the share and debenture holders will have the first offer of the shares. The "rumoured new company" is an existing fact, and the priority of option to take shares at par is all that can be offered to shareholders in the present company.—*Great Winchester-street, May* 13. A. A. DE METZ.

GOLD MINING IN MINAS GERAES

SIR,—An American gentleman, Mr. Joseph R. Partridge, writing to you from Minas Geraes, Brazil, bids for capital in this market to conduct "legitimate mining" there, for which he says there are great opportunities. Let those who would entertain the idea of placing money for this purpose enquire first what has been the recent experience of gold mining in Minas Geraes. The Captains Treloar—able miners and men of great experience in the province—selected some half-dozen of the most promising properties, and had "a liberal provision for working capital" provided by the British public. Of all those only one ever paid a dividend, and all but one or two have wound up with a loss of all their capital.

The question for investors to consider is—Are American gentlemen, strangers in the district, likely to be more successful in the application of British capital? Their first enterprise in this direction—the Sro Cyriaco—is hardly encouraging; indeed, it has been considered a failure, and American capitalists are annoyed with its managers for having made no return for the money embarked. So, failing to get capital in the States, they hope to get "plenty of working capital" out of John Bull. ONE WHO KNOWS.

London, May 13.

WHAT ABOUT TIN?

SIR,—Seeing the great fluctuations in the price of tin—up one day and down another—and continually seeing accounts in the different newspapers of the great reduction of stocks in England and Holland, anyone at all interested in Cornish mining is led to think seriously of the matter, and to look about and see if there can be any reasonable cause for such a depressing influence to be brought to bear on our tin mining. Certainly it is depressing, for while things are in such a state there is not the slightest chance for any new mines to be set to work or old ones re-worked. If there is any cause, either from too large a quantity expected from Australia, the large stocks in America—caused by nearly all the Straits tin being carried there for the last three months, and now, according to statistics, being upwards of 6000 tons—or if there are any lots of 600 or 1000 tons in hiding places ready to be thrown on the market at any time, I think the public should be made acquainted with it, for according to the latest statistics, if we take the total stock in England, Holland, and America, it exceeds 20,000 tons, and if such be the case there can be little, if any, diminution in stocks, and the English supply is more than ever it was. If this state of things is to continue for any length of time it is better the truth should come out, and the attention of the public generally directed to some other industry whereby a livelihood may be obtained. Anyone replying and giving his opinion on the matter will oblige— A CORNISH MINER.

May 11.

ALL ABOUT TIN.

SIR,—Great disappointment to many no doubt the recent very heavy and continued dropping of the price of tin has been, but to the initiated it was clearly foreseen and acted on. Some who had a kindly hint discarded the idea, and would none of it. Others not only paid inflated prices for mine shares but actually started preparations for re-working old, deep, and watery mines. These people are now the first to feel the sharp disappointment, and to extend the dismay they feel in their own hearts. Let us review the history of this last bit of flare up. A sharp rise in the price of tin; everybody excited into speculation in mine shares; money quickly made; price of shares pushed higher far than there was any sound cause to warrant; some people mad on having made fortunes, and others madly envious because they had not. Then quickly comes a change of scene. A sharp drop in price of tin mines—shares lower; repeated drops, and mine shares unsaleable; prospective fortunes gone off in smoke, carrying some of the solid, hard-earned coin along with the more shadowy; everybody who holds stock down in the dumps, many very heartily wishing themselves safely out of it.

Now, it occurs to me that a healthier tone might be given to mining matters if much of this unwarrantable excitement could be guarded against. Undue excitement must always be surely followed by undue depression; and if people would only remember this many of the evils consequent on mining speculation might be avoided. We cannot get along in the world very well without metals, neither can we get metals without mining for them. Most people are aware of this; and yet by the majority of people mining for the very metals necessary almost to our existence is held in disrepute. I do not think that we have further to seek for this feeling than indicated in the foregoing remarks regarding excitement in mining speculations. There is no doubt that many heavy losses are made entirely by these excited inflations in the prices of mining shares at such times as we have just passed through, when the money has merely passed from one pocket into another, both being outside the mines, and generally outside the men who follow mining as their profession or pursuit A miner sticks to his business as men in other pursuits do. If he has a good opinion of the prospects of his mine he mostly endeavours, as far as he can, to realise those prospects and to work his mine. The price of shares, whether up or down, does not much influence him. He simply pegs away until his mine proves either good or bad, and he contrives to be as contented as he can to go up or to go down accordingly, as the case may be. If this course be pursued mining for the metals is raised at once into prominence among the most honourable of all pursuits. Should it be questioned whether this is ever carried out in all its purity, I can point out where a single miner worked extensive tin mines on his own responsibility quite recently, and would not introduce his friends into them while the prospects were uncertain. At length circumstances compelled him to give them up, and although they are now being worked by other parties, their present poverty justifies his hesitation about leading others into the chance of loss. It is not in the power of all men to carry out sound principles thus extensively, but any man who acts on this principle so far as he can do so will not bring any disgrace upon his profession, neither will he have contributed to that disrepute in which this pursuit is too often held. There is no reason why metallic mining should not be generally profitable—most of the losses being caused by market operations and by interested parties working old, deep, and watery mines. To guard against the former caution is needed about purchasing in excited times, and the latter can always be guarded against on a little enquiry. Over excitement on a rising market and undue depression on a falling are both unwelcome and unprofitable concomitants.

The assumption of authority by men who have no right to be heard is also a source of loss to many people. Quite a number of men assume authority in mining matters who do not know a lode from a gate-post. I have known one who did not know granite from a stratified rock, another who did not know phosphate of lime from hornblende, and another who did not know black tin from white iron. But the most mischievous of all is the man who leads you to believe that tin is going to rise 20*l.* per ton just before a drop of 25*l.*, for you will find many to help you to guard against the former errors, while there are few, and may not be met with readily, who can guard you against the latter.

Tin smelters were once regarded as a power in this county; that power has now gone into other hands from circumstances quite understandable. Whether or not they can again wield the power they once did is a question depending on many issues. Whether their former power was beneficial to the tin mines or otherwise may be a question for the expression of many different opinions. My opinion is very decided on both questions, but that would afford matter for a very long letter, the question before us at present being how to avoid the evils and secure the good under present circumstances in regard to tin mining, and this I think I have to some extent indicated.—*Redruth, May* 13. W. TREGAY.

THE WEST OF ENGLAND IRON ORE COMPANY.

SIR,—I was pleased to see the letter of Mr. Symons respecting the above property in last week's Journal. Before investing I was desirous of getting the best information to be obtained, and Mr. Symons' letter bears out what my brother, who is a practical man, told me about the mine, which he visited a few weeks ago. The great advantage over ordinary mines is that there is no machinery required for pumping, &c. A better spot for working the mine at the least possible expense could not have been chosen; this is the evidence of my brother, who has taken a considerable interest in the concern, and has induced me to become— A SHAREHOLDER.

MINE INSPECTOR FOR THE WESTERN DISTRICT.

SIR,—I find from the Royal Cornwall Gazette that Dr. Foster, the present Inspector of Mines in Cornwall, Devon, &c., has been appointed to a similar office in Wales. It has not transpired who his successor is to be, although said to have been nominated by the late Home Secretary. I believe that every person who knows Dr. Foster and his work will admit that he has discharged his duties very faithfully, and many will regret his removal as a friend. As to a successor for the office no one in Great Britain or elsewhere is better qualified for it than Mr. J. H. Collins, F.G.S., Truro, the county analyst. Mr. Collins is a geologist, mineralogist, chemist, and the author of numerous scientific works having special reference to mining. No one is more conversant with Cornish and Devon mining than Mr. Collins, and no one has done so much gratuitously for the enlightenment of mining men as he has. I think that in the appointment of an Inspector for the district his services and his eminent talents and qualifications should not be overlooked. R. SYMONS.

Truro, May 13.

DISCOVERY OF COPPER ORE IN WALES.

SIR,—Having seen in the Journal a few months ago a discussion between your North Wales and Cardiganshire Correspondents and several others as to the probability of copper ores being discovered in large quantities in Cardiganshire and Montgomeryshire I think, if I recollect rightly, that the said discussion commenced from a very rich discovery of copper being made at that time at one of the Cambrian Mines—some of the copper selling, as I was informed, for more than 20*l.* per ton. I have always felt a good deal of interest in Welsh copper and lead mines—sometimes too much so, and on other occasions I have had to regret that I did not feel much more interested; while, upon the whole, I have been practically benefited by the Welsh mines. But mine has been a benefit more from private companies than from public companies in connection with Welsh mining and slate quarries. Being at Llanidloes about a fortnight since I was informed of a very rich discovery of copper having been made some time ago about six miles west of that town; and having a day to spare, after making a few enquiries, I sallied forth on foot up a winding tolerably good road along the sides of the Severn, and in a gorge of the mountains on the south side of the big Plynlimmon, and through which the River Severn rushes in its onward course towards the sunny South, I found the Great Gias copper mine, certainly at first appearance anything but prepossessing; but after entering a day level, in company with Mr. Price, the person in charge of the mine, behold my astonishment at the splendid course of copper in one unbroken line for nearly or quite, I should think, 50 fms. long, to be seen along the bottom of the level, with still a strong rib of about 6 in. to 10 in. wide in the western forebreast going into the hill. Mr. Price also showed me in the lode at surface a fine branch of copper about 1 ft. wide, for several yards long. The copper at Great Gias appears to be the highest or richest quality I have ever seen in this country, taking it altogether. He also pointed out to me the Great Van lead lode, passing through the Gias hill to the south of the copper lode. The Van lead lode has a strong gossan on the surface, and is very wide, and I saw some stones of lead ore out of it, but nothing comparatively has been done upon the lode. After examining all that was to be seen at Great Gias what occurred to me was what a pity it is that so very excellent a mining property should not be vigorously worked by a first-rate company—for it is, at least, one of the finest and most promising mining properties that I have ever seen; but I am not a practical miner, mineralogist, or geologist, though I have seen a good many mines in my time, and have not the remotest interest in Great Gias, but should be glad to take an interest in Great Gias Copper Mine, should a company be formed.—*Handsworth, near Birmingham, May* 12. B. B. BLAKE.

LEAD MINE ENTERPRISE IN LLANARMON.

SIR,—I now have the pleasure of giving your readers, through your kind permission, the underwritten extracts from the reports of two talented mining and civil engineers which I have had the pleasure of perusing, and by the kindness and courtesy of friends am enabled to make them public for the benefit of those who are or may become interested in the mines of this important district. I give these reports as evidence of the value of the mineral ground spoken of, and as showing very conclusively in my opinion that great results may be attained here by the expenditure of no great amount of money. Without further comment I now give the reports, which I will call Nos. 1 and 2. The author writes from the Lady Ann Lead Mine, Nant-y-Palme: No. 1.—"This mineral property is situated in the parish of Llanarmon, in the county of Denbigh, and embraces a continuation of the main lodes of the once very rich and celebrated Westminster Mines, to the extent of over 400 yards in length, and is held under royalties the most moderate I have yet seen granted in the district. Several shafts have been sunk, one on the course of Westminster lode 45 yards deep, and the other on the Pant-y-Gwlanod lode 31 yards deep. In the Westminster there is a small run of ore formerly discovered at 5 yards deep from surface, from which about 5 tons of ore has been raised, and some ore is now to be seen in the vein, which is a most masterly one, about 4 ft. wide, and at the bottom of the workings a 'stooking' of loose clay, &c., would appear to be a strong indication that a run of ore will be found a little deeper. I look upon this speculation as one of no ordinary merit, and I can with confidence advise the necessary outlay for its effectual exploration. I may say that I have seldom or never seen a property that is so likely to lead to important results from a small amount expended, inasmuch as the main lodes are already found, and proved to exist in the property. Such lodes also having proved so rich eastward it may fairly be inferred that they contain great riches in this property, and for the capital required, which will not necessitate expensive steam machinery, I should say the results are likely to be proportionately remunerative. A small experimental trial (which has been made since I wrote the above) has been made in the back of the Pant-y-Gwlanod lode, which was found at the surface, just under the grass, in great strength and of the finest mineral compounds, from which good specimens of lead ore with white carbonate of lead and calamine were taken out within 1 ft. from surface."

I find that if I attempt to give you report No. 2 this week I shall occupy too much of your space, and so, with your permission, I will defer it for another time.—*May* 11. ENQUIRER.

MINING IN THE COMBMARTIN DISTRICT.

SIR,—Hearing that a gentleman of considerable mining experience intends paying Combmartin a visit very shortly for the purpose of inspecting some mining property on the west side of the valley, where little or nothing in the way of mining has ever been done, I would venture to suggest that a visit be paid to some property adjacent, belonging to Mr. John Boyle. There are said to be several well defined lodes running through the property, which can be very easily worked, and which certainly ought to be opened out. It is the candid opinion of the inhabitants of this village that could any one be found sufficiently spirited to make a fair trial on this property something rich would shortly be discovered. There are splendid advantages of situation, water, &c., and any practical man would confess that a thorough trial of the whole of the lodes could be accomplished for a very small sum. DEVONIAN.

Barnstaple, May 11.

SOUTH DARREN SILVER-LEAD MINE.

SIR,—It is very gratifying to find this mine is opening up quite equal, if not beyond expectations. That they are making large profits is proved by the quarterly dividends of 2s. per share (3600*l.* yearly). When you take into consideration the number of shares, and price many lead mines are selling for, these shares certainly offer an unusual advantage at present low price. The present dividends are about 12 per cent.; this is more than any other lead mine pays. With an advance in the value of lead they would pay a much better dividend. I find they have large reserves, valued at nearly 30,000*l.*, and these reserves continue to increase. The eastern part of the mine is still unwrought, and here they have a good lode and splendid future prospects. The lode in the bottom of the shaft is worth 30*l.* per fathom; they are sinking through this lode to the next level; this will lay open a good run of lead ore. If investors would buy into good sound lead mines, such as Roman Gravels, Van, Great Laxey, Mona, Minera, Derwent, and South Darren, we should not hear of such losses as are too frequently met with through investing in mines where nothing is to be had but promises, which are never fulfilled. AN INVESTOR.

WEST CARADON COPPER MINE.

SIR,—The attention of the readers of the *Mining Journal* has recently been drawn to this old property, and I may now add one or two items to the good news already published. The main features of the mine are that it can be worked for many years without any pumping machinery, and all the great discoveries in both this and the adjoining South Caradon were chiefly made in the upper levels. Three masterly lodes containing what Capt. Richards describes as "splendid copper" have been discovered, and upon these lodes the company are now driving, and should there be no deeper workings attempted the driving of these alone would be sufficient to make the mine a great success. That the mine has all the elements of such success cannot be doubted, and it only remains to prosecute it with the vigour and perseverance which its glowing prospects entitle it to to achieve so desirable a result. There can be no doubt entertained by those who know this property of its being fully equal, at this comparatively early stage of the company's proceedings, to the production of copper in such quantities as to give handsome returns to the shareholders. It is quite certain that this old mine will, under present management, soon re-enter the Dividend List, where it figured so prominently for many years, and which formed the foundation of colossal fortunes to those proprietors who retained their confidence in it from its early days.—*May* 11. ADVENTURER.

SHORT NOTICES ON IRISH MINES.

BY WILLIAM THOMAS.

To the north of the Mizen Head the "Three Castles Head" promontory forms the south entrance to Dunmanus Bay, which is about at the entrance 6 miles wide, and runs inland to Dunbeacon and Durrus, 18 miles. A belt of several lodes run east from Three Castles Head, through Carrigmanus, Balteen, Dhurode, Lackavaun, Dunmanus, Dunbeacon (Cahirolickaney barytes), Dereenalamon (or Bandon barytes), Schanaleury, Derrycarhoon, Shronagree, Ballybawn, and Mount Kid—a distance of about 20 miles—and with trifling exceptions this great mineral mountain range is unexplored, but every pit opened on the lodes produced good ore. The lodes in the cliffs at Three Castles Head and Balteen contain yellow copper ore, quartz, &c. At Dhurode Mine unimportant trials were made many years ago at a shallow and deep adit level, and cargoes of yellow copper ore raised and sold. A caunter lode or cross-course runs inland from the cliff in a S.S.E. direction, and intersects the range of east and west lodes, elvan courses, &c.; and at the points of intersection the deposits of ore were found. A good road runs through the sett, and produce can be shipped and supplies landed close by in Dunmanus Bay. The owner of the property is Mr. B. L. Fleming, J.P.

To the east of Dhurode—in the cliff at Lackavaun—there is a lode of quartz, intermixed with yellow copper ore 12 ft. wide, but never having been cut through its full width has not been ascertained. This great lode is said from assays made to be auriferous; but when properly opened it will, no doubt, produce large quantities of copper ore. The property belongs to Lord Bandon. At Dunmanus in trial pits rich grey and purple copper ore was found. A little to the south of Dunbeacon, on the eastern slope of Cashelane Mountain, at Cahirolickaney, a deposit of barytes was found running north and south, from which many cargoes were raised and sold, and shipped at Dunbeacon, Dunmanus Bay. The barytes is intersected by an east and west copper lode, and a lode of mundic about 6 ft. wide runs in a southerly direction. An adit level drains the water about 10 fms. deep. There is a good road from the mine to the quay, washing-floors, &c. Lord Bandon is the owner. Dereenolomane or Bandon Barytes and Copper Mines, are situate on the western side of Mount Corin, and about midway between Durrus and Ballydehob the road to those places goes through the mine. This great deposit of barytes was discovered about 40 years ago near the side of the road, and from an irregular mode of operation thousands of tons have been raised and sold; the last contract for 1500 tons (crude) was at 36s. per ton. The lode in the bottom of the mine will produce 20 tons per fathom of first quality pure barytes, perfectly white, and free from stains or the admixture of other substances. The direction of the barytes is north and south, and cuts across the strata, and in following its course 100 fms. south it will intersect two copper lodes, which in shallow openings produced several tons of grey copper ore and carbonate of copper. The Chinese for thousands of years have used extensively a preparation of barytes as a powerful fertiliser in the growth of clover, grasses, and other crops; and from my experiments I have no doubt on the subject of its great value. The manufacture of the article is simple and inexpensive. The shipping port is Ballydehob, to which from the mine there is a good road. Lord Bandon is the owner of the property.

POCKET MINING ATLAS.—Although it is not an invariable practice with capitalists to enquire the locality of the mines in which they invest—for quite recently an investment was made in Pestarena, which is on the Italian side of the Alps, "because all the other mines in Spain managed by John Taylor and Sons ultimately turned out well"—there are many who are more inquisitive, and to those of the latter class interested, or inclined to become so, in American mines, the new Pocket Mining Atlas, just issued (New York: Edwin Bolitho, Engineering and Mining Journal. London: Trübner and Co., Ludgate-hill), will prove very useful. Although only 5¾ in. × 3½ in., and scarcely more than ¼ in. thick, strongly bound in limp roan, it contains no fewer than 27 thoroughly legible maps, well executed in chromolithography; these include the United States, Southern States, Dakota, Montana, Idaho, Colorado, Utah, Nevada, California, New Mexico, and Arizona, and 15 maps of mining districts. Amongst the latter are two of the Eureka (Richmond) district, two of the Comstock, and two of the Leadville, as well as several others in which many

English capitalists are interested. The Atlas will prove a very useful companion.

REPORT FROM CORNWALL.

May 14.—If the managers of the leading tin mines do not ere long meet, and try to devise some means to make their influence felt in putting an end to the present disgracefully unsatisfactory state of things—for it is nothing else—it must be because in the words of Shakspeare they feel that "suffering is the badge of all their tribe." It is bad enough for them to have the presumedly official standards dodging about like a weathercock (last week they went up 4s.; this week they are down 5s.) without leaving their tin at the smelting house for days before the smelters will give them any price. We are bold to say that they could not be worse handled if they dealt direct with the London market? Is there no one who will cut the knot by smelting a parcel of tin for himself, and putting it directly on the market. It really only requires, we honestly believe, a leader to effect one of the greatest reforms that tin mining has ever known. There is no reason at all for considering the smelters in the matter. All they have been looking after—and there we do not blame them—is their own interests. But they have shown an utter inability to appreciate the signs of the times, which is very discouraging to those who have been accustomed to rely upon their judgment; and an utter incapacity to exercise any influence whatever upon disturbing elements, which have really nothing to do with demand and supply, but with buyer and seller. The only logical excuse of their existence as "middlemen" is, in fact, gone; and the mines would find that they could very well swim alone, if they would only try, instead of relying upon such weak agents of flotation as the smelters have become. There is one good thing, to which we have previously called attention—these ups and downs may deaden the share market, but they have very little influence upon prices; wise men prefer to hold on.

With some surprise we learn that the appointment of the successor of Dr. Foster as Inspector of the Metalliferous Mines, &c., of Cornwall, Devon, and the adjacent counties of Somerset and Dorset, was made by the late Home Secretary—Sir Richard Cross. The late Government had gone out of office before Dr. Foster's removal was probably known or even hinted at, and this method of procedure altogether shut the door against possibly the most deserving applicants. We say possibly, but a stronger term might well be used, if, as is stated, the gentleman selected is an entire stranger to the district, utterly unacquainted with the character of its mining operations, and personally unknown here, even by name, among 999 out of 1000—if, indeed, he is known at all. There is a very strong feeling in the county that if a gentleman of Mr. Collins's unquestioned qualifications, and very strong claims, was to be passed over, it should have been for far better reasons than any which are apparent here.

The announcement of the intended reworking of Wheal Mary Ann and Trelawny recalls the main reason of their stoppage. They were brought to an untimely end because of the stupid obstinacy of a neighbouring landowner (it is always well to speak the truth even of the dead) into whose land the lodes ran, and who would not allow them to be worked therein. When he died it was understood that he had tied up his successor hand and foot to the same policy; but somehow the difficulty appears to have been got rid of. It never ought to have arisen. In many countries all mines are treated as regalia of the Crown, and no individual rights are recognised. If there had been many Dr. Honey's in England the legislature would have had to interfere, and set private owners on one side as undeserving of this "unearned increment" they would neither develope themselves nor suffer other people to develope. It is quite true, however, that while there are not many landowners who would go so far as this there are not a few who in their way follow the same policy, by exacting when they can unrighteous and at times prohibitory rates of dues.

It is not so many years ago that a labour dispute in a Cornish or Devonshire mine was a thing unheard of. Of late, however, the West has moved "with the times," and they have become by no means uncommon. There has been such a dispute at Levant with regard to the hours of the tutwork men, the agents thinking that eight hours underground should be the rule, and the men standing out for seven. The forenoon core have been in the habit of working seven hours and the afternoon eight; and the latter struck to be put on equal terms. However, it was only for a few days, when wiser counsels prevailed and the men went to work again, leaving the decision of the matter to the committee.

TRADE OF THE TYNE AND WEAR.

May 12.—There is not much change to note in the Coal and Coke Trades here; there is, however, some improvement in Baltic business. Coal shipments are large, and prices have not yielded much, indeed coalmasters and merchants are very tenacious as to prices. The competition in the coal trade from other districts is very keen. The shipments of coal and coke at Tyne Dock continue large. On Friday last 20,000 tons were shipped. The general business of these rivers was better in the first week of May then in the month preceding, yet it does not advance so quickly as expected. The contracts made by merchants in the early part of the year for coal, chemicals, &c., are being slowly wrought off; prices are stationary, with the exception of chemicals; and although a large business continues to be done in this trade prices have been for some time falling, although stocks are very low. As a rule, the factories are well employed. Work is abundant at the iron shipbuilding yards too, and now there are not many men unemployed. The question of restriction of the output of coal by the Durham miners may now be considered in the main as settled, the Union having repudiated this absurd proposition; the men have, however, to a considerable extent adopted this course lately, and at many works they appear to be reluctant to give it up, and at some large works they still adhere to it.

We learn from Brown's Export List the quantities of coal and coke sent from the Tyne and Wear in April, 1880, and the quantities in the corresponding month of 1879:—In April, 1880, the total shipments from these rivers was upwards of 1,000,000 tons, and in April last year less than 600,000 tons, but the quantity last April was much reduced, owing to the miners' strike in Durham. The North-Eastern traffic returns continue to show a large increase, the amount being 30,194*l.* for last week, the largest increase being for minerals 18,682*l.*

The iron trade is firmer, but it has got into a disorganised state, which it will require some time to remedy; the trade is now so large as to admit of speculation, and this is indulged in to a great extent; that this is detrimental to the trade is but too evident, the extraordinary fluctuations in the price of pig-iron during the past few months is mainly due to the action of "bulls" and "bears." It is, however, evident that the iron and mineral trades in this district are making steady progress, the returns of the Board of Trade and of the North-Eastern and other railways abundantly prove this. It appears that the pig-iron sent to the United States in April amounted to 135,724 tons, while in April, 1879, it was only 4897 tons; bar iron, &c., 9536 tons, against 243 tons; railroad iron, 21,067 tons, &c.; a large increase of all kinds having been sent to the Great Western Empire. It is expected that during the current month there will be a continuation of these large shipments, but afterwards it is rather probable there will be a fall from the maximum. The rapid movements in the iron trade during the past few months are most surprising, fluctuations having occurred at all the great centres of the trade, at Middlesborough, Scotland, Cumberland, and at Barrow-in-Furness. In September last the price of hematite iron was 45s. per ton, in February it touched 130s. per ton, and is now down to 70s. per ton. Eight months ago this iron ore was selling at 9s. per ton, and in February last it was 35s., and at the present time the price is 15s. per ton, but deliveries on old contracts are still made at 9s. per ton. The movements up and down have been very rapid. The dispute in the iron trade has been settled, and most of the men have again got to work; the strike which if continued would have produced disastrous results has been happily cut short, and this result has been mainly brought about by the resolute action of the Union leaders who urged the men to adhere to the sliding scale, and accept the reduction brought about by its action. The men have very generally an impression that some mistake has been made by the accountants, and the question will no doubt be now investigated. Most of the collieries in the district continue to be fairly employed, some little time has been lost lately in the steam coal district, but that is exceptional, most of the gas and coking coal works are fully employed. The house coal trade continues flat. The reopening of collieries is now checked, that movement has indeed been carried rather too far in this district. The Redhugh Collieries, Gateshead, lately reopened, is doing well, a good house coal is produced here, which is sold on the spot. The new winning at Whetburn continues to progress, and extensive lime quarries have been opened out by this company, the lime being sent by rail to various parts of the district.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

May 13.—The slight improvement in the Iron Trade which I reported last week has not since last report become more marked, and the 'Changes both of Wolverhampton on Wednesday and Birmingham to-day were without much animation. The near approach of the Whitsuntide holidays added to the dulness, and purchasers only in comparatively few instances would give out orders. Perhaps the most activity is noticeable in connection with the Tin-plate Trade. During this week and last some good orders have been received at these works, both on American and European account. Common coke qualities are variously quoted at from 18s. to 20s. and 21s. per box. Native charcoal qualities are 30s. per box. The marked bar firms uphold the official price of 9*l.* Sheets (singles) are priced at 8*l.* 10s. and 9*l.*, but sales have been reported even as low at 8*l.* Pigs are plentiful, but at prices which cannot be very remunerative to producers. Tredegar hematites are to be had from makers at 4*l.* 10s., but West Coast sort ared offered by speculators at 4*l.* Barrow hematites are quoted by makers at 4*l.* 10s. Coal is in larger output upon the week, bnt the demand is only limited, and the stock at the pit mouths are accumulating. Quotations are based upon from 7s. 6d. to 8s. for forge qualities.

Mr. Richard Chamberlain, the Mayor of Birmingham, is talked of this week amongst the trade as likely to be the new umpire of the Mill and Forge Wages Board in the place of his brother, the Right Hon Joseph Chamberlain, M.P., who has now formally resigned.

The arbitrators under the South Staffordshire Mines Drainage Acts have held a public meeting in Wolverhampton to hear appeals against their proposal to make a draft mines drainage award for a rate on all the minerals raised in the Tipton district. It was estimated that the maximum rate allowed by Act of Parliament would be required—namely, 3d per ton on fire-clay and limestone, and 6d. per ton on ironstone, coal, and slack. Appeals were heard for a reduction of the rating of Lord Dudley's Claycroft, Conygre, and Foxyards collieries, and it was decided that Mr. J. Marten, the mining arbitrator, should visit the collieries and report to his colleagues before a final decision was given upon them. A similar arrangement was agreed upon with respect to the appeal of Messrs. S. Groucutt and Sons, Old End Colliery. There were also other appeals. Most of the appellants will be rated in the same proportion as last year, but a few who last year received contributions from the Commissioners towards their pumping expenses will this year have the rate reduced instead, as the Commissioners have for the present ceased their former contributions.

The miners at Talke and Harecastle, North Staffordshire, remain out on strike against the 10 per cent. reduction in their wages. At a men's meeting this week it was stated that coal was cheaper now than it was 25 years ago, and it was argued that wages were lower than they ought to be already without further reduction. The men decided to keep out until the notice was withdrawn.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

May 13.—Trade in Derbyshire has undergone but little change since last notice, for it cannot be said to have improved in any way. Lead mining goes on much as usual, and a fair amount of ore is being produced at a few mines, for, as has been the case for some years, the great bulk of what is raised comes from less than half a dozen mines. In pig-iron the output of the furnaces is well kept up, but the demand is not so good as it was, while prices have come down considerably. The feeling, too, is that the lowest point has not yet been reached, so that consumers merely purchase for what they require at once, so that stocks are now increasing at several places, but no doubt they will go off when the trade gets settled, for there does not appear to be any diminution in the production in the manufacturing centres. The mills have been running tolerably well, but a great deal more could be done were there orders. At the foundries a moderate business continues to be done, pipes appearing to be in most request, not much as yet being done in builders' castings. House coal appears to be getting in still worse request, so that the collieries are working short time, and are likely to continue to do so for a considerable time. The London trade has fallen off considerably, while prices are still at a point that can scarcely leave any profit whatever to the colliery owners. From Clay Cross there has been sent to London of late at the rate of about 4300 tons a week, but not so very long since it was about 6000 tons a week. Of Silkstone coal a tolerably fair quantity has been sent to the Metropolis from Eckington and some other places. Steam coal is going off better, and the railway companies are now increasing their consumption. Engine fuel is still but in moderate request, but a steady business continues to be done in coke for iron smelting and other manufacturing purposes.

In Sheffield there is marked activity at most of the large works, and the mills are running well, there being plenty of orders in hand for almost every description of rolled iron. Ship-plates, sheets, bars, and merchant iron generally are being largely turned out. Some of the houses engaged in the making of crucible steel were scarcely ever busier than they are at present, heavy contracts being in hand. In Bessemer rails there has been no falling off, excepting indeed, in price which has come down considerably, for orders are now booked at about 8*l.* per ton instead of 10*l.* 10s. as was the case not so long since. Axles, tyres, and all kinds of railway material are being extensively produced, whilst a good deal is also being done in steel-faced armour-plates, for which the demand promises to be large, not only for our own but for other Governments as well. America continues to send us large orders for a variety of goods, and a steady business is also being done with Australia. There is more activity with respect to sheep-shears for South America and our own colonies, so that the hands are now well employed, and the same remarks apply to edge-tools. Cutlery manufacturers have become busier, and file and saw makers are much better off than they were. At the engine and machine works, where business has been quiet for a long time, some few orders have been recently booked that will put the men on full time. Some of the foundries are rather busier in certain specialities, but there is as yet no activity as regards stoves, grates, boilers, and ordinary builders' castings, for which there is usually a good demand at this period of the year. At Milton and Elsecar the trade keeps up well, there being a full average output of pig at both places, whilst the mills are running well.

The Coal Trade of South Yorkshire is still quiet, and most of the collieries are likely to have a long season of short time, seeing that there is comparatively little being done in house coal, and the demand for which must now weekly become less. So over-stocked are the markets that the coal has to be sold at less than it actually cost the colliery owners, many of whom for a considerable time past have been losing money. The London traffic has sensibly declined of late, but hopes are now entertained that the directors of the Great Northern will reduce the rate to the Metropolis, which is now 8s. 3d. per ton including City dues, and if this is done it will certainly be of great advantage to the colliery proprietors, who have certainly the most valuable portion of the Midland coal fields in their possession. Steam coal goes off well enough, but to raise all that could be sold is simply to incur a loss by having to teem down the "softs," or household qualities. The railway contracts for the ensuing year are about to be made, and it is expected that the prices will be higher than those of last year, which were about 5s. 10d per ton, which could scarcely have paid, leaving out of consideration the question of profit. Coke is being extensively made, and for which there appears to be markets. It is said that the dispute at the Monk Bretton Colliery, which commenced in September last, is now in a fair way of being settled.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

May 12.—In resuming our journey, I may explain that in the Corys slate district there are two veins or beds of slate, the "narrow" and the "broad." There are a dozen quarries at work in the district, half of them being worked on each bed. Usually the "broad" vein is worked in open quarries, as at Abercwm-eiddau and Minllyn, but the "narrow" vein is worked in chambers underground. The "narrow vein" is the purest slate rock. It varies from 15 to 30 yards in width. Both beds extend or range from north-east by Dinas Mawddy to south-east by the Abergan-olwyn Quarry, near Towyn. The Aberllefern Quarry is believed to have been worked in one form or other since the 14th century, but in its present form it dates from the year 1810. The other quarries are of more recent origin. We now pass along the road to Upper Corris, and we cannot but notice the well to-do and cleanly appearance of the people and the houses, as these last stand dotted over the valley, with the usual complement of places of worship. There is always an Eisteddfod, great or small, going on in Wales, and to-day on the walls and rocks are the placards announcing one shortly to be held. We first pass the Braich Goch Slate Quarry, the works being on our right hand, but the quarries ranging along the steep hill on our left. The yard seems full of slates and slabs, but we are told that there has been a great demand for them lately, so that the stock is not nearly so large as it was about Christmas last. The works are extensive, and have an air of business and prosperity about them. The same remark is true of those of the Gaewen Quarry, which is the next we reach. This is the oldest quarry in this part of the district, and it has been worked successfully for many years past. Next in order on our left hand are the Rhogwen and the Tyn-y-Cennant Slate Quarry properties. These have not been worked for some years, as the bare incline and empty works of the latter show. There is not, however, as far as I could learn, any inherent defect in the rock accounting for this, but the idleness has been due to want of enterprise and financial considerations. The two properties are now united in one lease or tacknote, and it it possible that before long work may be resumed. The railroad which has followed the course of the turnpike road all the way thus far terminates in the works of the Tyn-y-Cennant quarry. The four last-named quarries are worked in the "narrow" vein. But now on our right we see the Abercwm-eiddau Quarry, which has been recently opened for extensive working in the "broad" vein as an open quarry. It is connected with the railway by a short branch and incline, and it looks well equipped for work.

Trial quarries continue for another couple of miles, which will some day, no doubt, develope into good quarries. And now, as we turn north-east and skirt the foot of Cader Idris, whose eastern face we have seen for miles, we leave the quarrying district behind. To our left, a few miles distant, there is, however, the Crown Slate Quarry, whose deep level has recently entered good slate rock, and to which we hope, after years of labour, there is a good future. And so we reach Dolgelly, the head-quarters of the gold seekers in Wales, some of whom, probably, we shall meet at the Royal Ship Hotel.

Next to the appointment of a competent English-Welshman, the appointment of Dr. Foster to the post now held by Mr. T. Fanning Evans is very satisfactory. Dr. Foster loves his work, and he has made for himself a name. We hope he will take to Wales and the Welsh as if he were to the manor born, and very soon develope into a good Cymro. Mr. Evans, I believe, takes the managing directorship of the Mona Mines when his connection with the Government ceases. We wish him all the success that he deserves and that he seems likely to reap from the recent discoveries at these mines.

REPORT FROM THE FOREST OF DEAN.

May 13.—The leading topic of discourse among people of the district generally is the distress in West Dean, and several meetings have recently been held by influential inhabitants with a view to its alleviation. The Monmouth guardians, though very reluctant to entertain the matter at the outset, have since shown a very praiseworthy consideration and sympathy. Of course the name "guardian" is suggestive of several points for consideration—and as such officials are "poor law guardians," of course they are limited in action by the provision of "law" enacted for their guidance. One duty which they have to perform is temporarily to provide for able-bodied men in a state of destitution from want of employment; but on the other hand, it is equally their duty to protect the general body of rate payers against imposition from idle loafers, who would wish to draw fparish relief in order to escape work. The Monmouth guardians have apparently just discharged both duties with a high degree of prudence and kindliness. Able bodied men out of work (through the stoppage of collieries) can, by application to the commmittee appointed for the purpose, obtain tickets of authorisation for employment at quarries in stone breaking, and when they have families, with certain allowances for their children in the following manner:—The price per cubic yard is 14d., but the guardians add 2d. per yard for each child under a certain age, which enables the men with families to obtain better wages than the men employed stone breaking by the Turnpike Trust Commissioners, who are paid the first named price per yard, but have no extras allowed. We think that the arrangement is highly creditable to all who had to 'assist in bringing it about, and ought to silence snarling, carping critics, and satisfy the distressed labourers, as a kind as well as reasonable provision for their present affliction, as any among them who can obtain employment more to their tastes and capacities have full liberty to avail themselves of it. The design is not to encourage pauperism and a pauper spirit, but to assist them over a present difficulty. The short new line of railway just commenced will afford employment for some, but until the contractors have somewhat advanced in their plans they will only be able to employ a limited number. As to collieries and other large works, the prospects in West Dean are anything but cheering. Unless rumours are altogether untrustworthy, there is little likelihood of a re-starting of the recently closed works for some time to come. It is gratifying, however, to observe that parochial assistance is being seconded by public subscriptions and concert proceeds—a concert having been announced to come off at Cinderford on the 27th inst. ensuing. The Office of Woods has replied to an application for relief works that no evidence is before it to lead its officials to conclude that the circumstances are such as to lead them at present to interfere with the ordinary means at command, but that if such circumstances should arise assistance in some form may be looked for.

The coal trade on the eastern side of the Forest remains much as it was at the time of our last report, the variations being slight—in some cases for the better, and in others for the worse. Prices in the tin-plate trade are not so satisfactory as some time since, notwithstanding that employment has kept pretty steady. The iron trade, too, partakes of the reaction, so that employment has been abridged at the Cinderford furnaces by a discharge of several employees, and at the forges by occasional forced idleness.

A few days since Mr. Keeling, engineer of the Severn Bridge, was presented with a public testimonial in honour of his successfully accomplishing that great work, numerous influential local gentlemen and others being present on the occasion, several of whom delivered speeches highly complimentary to Mr. Keeling. Mr. Keeling very modestly replied acknowledging their kind testimony and opinions. The bridge, we believe, is thought very highly of, and Mr. Keeling will doubtless be long remembered as its gifted and successful engineer. Mr. Keeling, referring to the assistance rendered by Mr. W. B. Brain with the electric light, stated that in consequence of that assistance the bridge was completed eight months sooner than it otherwise would have been without Mr. Brain's assistance, as the electric light enabled the operators to work by night as well as by day. The bridge will undoubtedly prove a great and lasting blessing to the people on both sides of the river, as well as specially being a great boon to traders and proprietors of collieries and other works. The tunnel at Portskawett will also be a great public benefit when completed and opened for traffic. By universal silence it would seem to have been forgotten that early in the present century, between 70 and 80 years ago, an attempt was made to tunnel under the Severn near Newnham, close to Bullapill to the opposite shore adjacent to Arlingham, and considerable progress was made in excavating some distance under the bed of the river, but was abandoned in consequence of a rupture in the roof and an inrush of water from the river overhead. There was but little warning, only just sufficient time to enable the workmen to make their escape, for they were barely out when the inrush was in such volume that the forced air shot the carts (some of them) up the shaft, as if by some powerful explosion.

Some years ago we read an account of the matter in a monthly periodical published at the time, which induced us to make enquiries, and found that some persons considerably advanced in years in the vicinity retained recollections of the event, and confirmed as well as added to the published account. Had there been a Brunel at home, or any of our modern gifted engineers connected with the undertaking—supposing a contradiction of times and circumstances consistent with the assumption—the Vale of Gloucester, meaning its inhabitants, would have possessed the happiness and advantages of a tunnel under the River Severn for close upon three-quarters of a century ago. Alas! that the difficulty was not grappled with and conquered. But engineers of that day had far greater ignorance and stubborn prejudices to contend with than face the scientific men of this day. The tunnel, had it been completed, would have greatly influenced the trade of the Forest, and most likely have led to other changes which are now uncalled for, in consequence of the construction and al-

vancement of railways. But even now a bridge or a tunnel near Newnham would be a great boon to the public, and it does seem a great pity that the elegant structure designed, and which passed both Houses of Parliament some two or three summers ago, has been allowed to fall through for want of support.

THE FLAGSTAFF MINE, UTAH.

Prof. MORTON, of Salt Lake City, has addressed the following communication respecting this property to the Editor of the Mining Record, of New York. It is dated Salt Lake City, Utah, April 8:—

SIR,—The condition of the Flagstaff Mine is such that an intelligible report can scarcely be made based on anything at present in sight in their works. The Supreme Court decision in the Titus Mine case reduced the extent of the Flagstaff Mine to 100 ft. along the lode—just what was covered by their patent. The property was surrounded by "piratical" locations, which, as soon as the decision of the Supreme Court was made known, made short work of the Flagstaff Mine. Since then the various managers and lessees have been industriously engaged in gutting the mine; so that, as near as can be learned, there is but little ore in sight at present.

However, no prospecting has been done beyond what was done by the last manager, and as there has been but little ore extracted below the fourth level, it is fair to presume that there may be extensive bodies of ore above the sixth level of the mine, which could be easily got at and extracted; beyond that depth I suppose the cheapest way to work the mine would be to run a tunnel in from the level of the canyon. However, the first thing to be done is to acquire title to all the ground from the west end of the Vallejo Mine to the head of Days Fork, and from the top of Emma Hill to near the site of the old ore house; cover the entire tract by U. S. patent, which will permanently settle the title to mine; then they will be in a condition to go ahead and thoroughly prospect the ground from the third level down, opening up the ground wherever there is seen a small streak of iron oxide to follow, such streaks being invariably the threads leading from one ore body to another; this has been done with unvarying success in the Joab Lawrence Mine adjoining, which is now paying very well.

It was in as bad a condition as the Flagstaff until the present owners got hold of it. The following, written and published in the Engineering and Mining Journal, September, 1876, page 152, may serve to describe the mine as well as any thing I can write at present:—

"The Flagstaff Mine, in Little Cottonwood district, may be taken as representative of the Bonanza class of mines; the ore occurring in large segregated masses inclosed in a mass of broken country rock and connected throughout by small strings or pipes of ore; I think the largest deposit found in this mine was about 300 ft. in depth by 200 ft. in length, and about 20 ft. in widest portions. It will be seen by the above that the prospecting of the mine is a very intricate task, and one requiring constant and skilful supervision. That there is a good deal of merit in the mine I can readily believe, as the condition of the mine can be but little worse now than it was in the autumn of 1872, when I took charge of the underground workings. Prior to that time the mine had been producing large quantities of ore, but just then it seemed to be on its last legs. The mining captain, Goldsworthy, had a bunch of ore which he called 'the nest egg' and which he was holding in reserve until all the pickings were exhausted. I started prospecting, and left his 'nest egg' to take care of itself, and at the end of a week the mine produced 25 tons a day, and within two weeks 30, 40, and 50 tons daily, then it began to come too fast, the dump and the sacking-floor had to be enlarged, thousands of new sacks ordered, the product run up to 75, 100, 125 tons daily, and the dividend was increased to 3 per cent. a month. In a short time the management changed—the product has since been large but no dividends have come to the shareholders; still I have reason to believe that the Flagstaff is a good mine, and if honestly managed will pay well."

J. H. MORTON.

THE NEW ERA OF PROSPERITY IN CALIFORNIA.

The business depressions in California are generally short, sometimes severe, and always followed by seasons of great activity. No ten years of chronic suspension, as in the Atlantic States, but a few months at a time, which are sufficient to make everybody impatient and to set everybody to growling. The go-ahead Californian wants to do something all the time. Talk to him of rest! He don't want any rest. He would rather have the excitement of failing in business than a long rest. In that time he could not only fail, but recover his fortune, and start out to make another. We have had a few months of business depression. It has been severe. No doubt it has been aggravated by much violent speech which was taken to mean more than there really was in it. It is true that violent speech is not good for a community. But it has never been more harmless in the matter of violent outbreaks than in this city. It has never made a mob, and it is doubtful if it ever will. It has made capitalists timid, and has no doubt deadened many enterprises. These will be resuscitated again. After the paroxysm of fever there is convalescence.

The outlook to-day is most encouraging. The entire State has been well watered, crops are in a promising condition. The production of precious metals within the limits of California exceeds $20,000,000. The productions of agriculture reach, in a favourable season, something like $100,000,000. The more sanguine are beginning to predict a wheat crop of 40,000,000 bushels, and a wine product of 10,000,000 gallons. The new wool crop will bring nearly double what it would have brought a few months ago. Outside of California, as well as inside, mining industries are certainly in a hopeful condition. Note the immense field for mining operations in Arizona, which has just been opened up. The Southern Pacific Railroad is 18 miles beyond Tucson, and will soon be skirting the borders of Sonora. To-day hundreds of men have gone over the line for the purpose of taking up new and old mines in that State.

All these mining industries are, in a large measure tributary to San Francisco. Supplies go from this point, and the bullion is returned here. Take a single mine in Arizona within our knowledge. The mill cost about $50,000 in this city. It cost about as much more to transport it and set it in operation. At the first trial of a few days $40,000 worth of bullion was pounded out, sent to this city and sold. The mere selling and buying of stock at the Exchange add very little to the prosperity of the city. Nothing is created. It is a mere shifting of stocks from one hand to the other. If a part of this business goes to New York it will in no way injure the prosperity of San Francisco. This city has not been built up by transactions at the Stock Exchange. It has been built up by the permanent development of wealth in agriculture, mining, and manufacturing pursuits. A good mine, operated legitimately, a thousand miles from this point, is of great importance to this city. Some business firm gets the contract to furnish the mill. They pay out a part of the money for wages, and another part for material. Supplies are bought here. The bullion is sent back. It is sold here in most instances, and the banks make a moderate profit on the transaction. All this helps the city. The large blocks of modern buildings have been built out of the more legitimate profits of mining—not on what was made by tossing a stock back and forth at the Exchange, but in developing mines by much hard work. Now this kind of mining industry promises to be as important hereafter as it has ever been. If not so much bullion is taken from the Comstock Lode, more will be taken out somewhere else. Here are two great industries which are to-day in a most promising condition. The plains have been watered and the mountains are full of snow

Probably, there is more business activity outside, say in the large towns of the interior than in San Francisco. That is not a discouraging fact. These towns are the first to feel the new impulses of business. But in the long run town and country prosper together. The unemployed labourers will shortly find work. They come into the city by thousands in the autumn. They will go out in the spring. It is said that the new directory will show a small loss of population in San Francisco as compared with a year ago. Some thousands of Chinese have left. This diminution of a floating population is not a disadvantage. It may be a positive advantage to the city. The population which is fairly anchored is not diminishing. At this date there is, in spite of all adverse influences, a healthy immigration to California. Families are coming to stay. The reported disturbances in San Francisco have made little impression upon these people. They have intelligence to know that the advantages for securing permanent homes have not been abridged.

— *San Francisco Bulletin*, April 7.

Meetings of Public Companies.

HULTAFALL MINING COMPANY.

The second annual general meeting was held at the offices, Austinfriars, on Tuesday,—Mr. GEORGE BATTERS in the chair.

Mr. W. J. LAVINGTON (the secretary) read the notice calling the meeting.

The CHAIRMAN said: Gentlemen, this is, as you know, our second annual meeting. As was the case with its predecessor, we come before you with a certain amount of disappointment, and a certain feeling of regret, that the hopes which were then expressed have not been carried out. The reason why is, to a certain extent, a repetition of the oft-told tale in mining matters—bad management, and, to a certain extent, paucity of funds. With regard to the management, a total change has taken place, inasmuch as we now have a new manager, and your affairs are so completely in hand that you certainly will be able from this meeting to judge whether or not you have a reasonable prospect of the mines being worked in a miner-like way. Before entering into details with regard to the doings of the past year, I think it is first due to you that some few remarks should be made on the accounts. Taking the debit side of the accounts you have, as you had last year, the capital stated in round figures at 60,000*l.*, in 12,000 shares of 5*l.* each. The amount of authorised debentures is 10,000*l.*, of which 5920*l.* have been issued; you have standing to your debit creditors in England 3000*l.*, and in Sweden 500*l.*, with bills payable for 800*l.* Adding the amount of debentures issued to the bill payable and the creditors in England and Sweden the amount will come out somewhere about the amount of your authorised debentures—10,000*l.* You might naturally say, in looking at these accounts, that it is a dangerous position for a company to be placed in to have 3000*l.* of open creditors and 800*l.* of bills payable with so small a sum to come and go upon as you see at the credit side of the accounts. But I must tell you candidly that, financially speaking, your company is perfectly safe from almost the possibility of a collapse, inasmuch as very nearly the whole of the 3000*l.* standing here is an indebtedness in England, and is money which has been advanced by the board, and those gentlemen are perfectly willing to take that amount out in 5 per cent. debentures of the company at par—(hear, hear), thus reducing the amount of your indebtedness to a very small sum, chiefly represented by the 800*l.* odd of bills payable. Since these accounts were made up a portion of the amount has been paid off—about 150*l.*—leaving the bills payable standing at 700*l.* Having given you an explanation on the dangerous or debit side of the account, we will come now to the credit side. The outlay upon the mine consists, first of all, of machinery and cost of working, upon which I think no comment need be made, as the amount stands at a comparatively reasonable figure—if anything, at too small an amount, for I should have liked to have seen a larger amount spent. The preliminary expenses stand as they did last year, 90*l.* The interest is 125*l.*, which would be a small sum paid for interest on debentures. There is a small sum of 13*l.*, which has been received. The office expenses, including printing, stationary, directors and office salaries, petty cash, &c., 600*l.* Our excellent auditor has very kindly given me a *résume* of these items, which I think you should have read to you. The five directors, for one and a-half year, ending 1878, at 400*l.*, which was taken by them in 5 per cent. debentures, amount to 600*l.*: leaving a sum of 224*l.* for all your office expenses and everything else for a year and a-half. So I do not think it can be said that your business has been carried on at any very excessive cost. (Hear, hear.) Then I come to the question of ore sold. There has been ore sold during the year amounting in cash to 791*l.* We have here to-day a telegram from Gothenburg of the sailing of a steamer for Antwerp with 700 tons of blende and 25 tons of lead, worth (say) in round figures a couple of thousand pounds That, I need not tell you, is ore which had been raised during the period that these accounts run over, but which did not appear in the accounts; therefore, instead of the amount standing as only a credit of 791*l.*, there is in reality raised and sent away ore which will be realised in a very few days which will bring the amount to nearly 3000*l.* If you consider that at the present time your mine has only been sunk to the depth of 25 fms., and very little stoping has been done, the wonderment to any one who understands mining is rather where the ore has come from than that the amount is small. The amount is very encouraging for the two years you have been at work, and for the very small amount of work which you have done. I think it augurs well for your chances in the future that you have more than an ordinary mining chance in Hultafall, and that Hultafall will prove what Capt. Arthur Waters, Capt. Southey (of West Chiverton), Mr. Williams (of Van), and several others reported that the mine would be capable of doing. I may say there is every reason to believe that in the future there will now be realised something like the expectations which those gentlemen—men of the greatest experience in this country—told us that we had every reason to expect would be the result of our enterprise. It is no use going back into the past. We have had our experience to learn, and we have had to pay for it extensively in time, and we have also had to pay for it in money, and the only hope is that we shall profit by our past experience. Had it not been that we have had considerate men to deal with, I am very much afraid Hultafall would have been remembered as a mine of the past; but those gentlemen—promoters of this mine, and the owners of this mine—had behaved with such consideration to us, and with such an ardent desire to see the thing made a commercial success, that there has been nothing which it has been in their power to do that they have not done. They had not sold a single share; they took the whole of the purchase money of the mine in shares, and they hold their shares at the present moment, and they have lent the company large sums of money, and have spent months of their own time in trying to achieve a success. And not only so, but I have further to tell you that a group of mines adjoining this company's property—that is, the Hultafall Mine proper—were owned by them, but with which we had literally nothing to do, and the Vieille Montagne Company has been litigating with them for years, and have been trying to oust them. The trials have been carried from Court to Court, and at last the final trial before the King will be settled in the course of a very months. By the last decision in one of the superior Courts they have got a clear verdict. Within the last few weeks it was sent from a lower Court to be tried upon its merits, and independent of technicalities; it has been tried upon its merits, and we have a letter from the solicitor to the suit which has been won by Messrs. Maxfield's friends, and that damages also were awarded against the Vieille Montagne Company. They have the power to take the suit further; it has been taken further, but the solicitor writes to say that the matter may be so far considered as completely settled that there is nothing to prevent us commencing work at the mine. I myself, about a month ago, went out to Sweden so that I might report to you from what I saw with my own eyes as to your true position there; and I can only say that I shall be glad if any of our shareholders would visit the property, and see and judge for themselves. These mines, which have been in litigation by the Vieille Montagne Company, are mines which promise to be of as great value, in my opinion, as the ground owned by the Vieille Montagne Company, *per se*, and it would be very difficult to put a value upon them. Such is the opinion of Capt. Arthur Waters and those who reported upon your own mine, they having this mine at the same time. It is no use describing these mines to you, as we have no interest in them, but I will tell you how your directors and Messrs. Maxfield have behaved in the matter. We have had a kind of verbal promise from them that they would take the claims of the company into consideration, and see whether upon certain terms they could not give us the mines or land for a certain interest in working them, and they have generously come forward and handed the mines over to the company, not upon such terms as they could have got for them—for they could have got a large sum for their sale—but at a very small royalty, so small that I think you will be astonished when you think it is only 1s. 1½d. per ton upon ore raised. In addition, there is a small sum to be paid to Swedish owners. There were a number of Swedes who had interests in the mine, and I saw the principal owner and settled with him that he should be paid the sum of 500*l.* in money and 200*l.* to another section, and beyond that there were some costs out of pocket, which Messrs. Maxfield had incurred in the matter. Already work has been commenced, and we expect to see the lode in Old Silver in the course of a few weeks. From this mine very large returns can be made; it will be a very small matter to return from 500 to 1000 tons of blende per month, and also a large quantity of silver lead ore. Then you come back to what our own mines are doing, and Mr. Smith, who is now there, and is carrying out what he promised, is raising a sufficient quantity of ore to pay costs and leave a profit. That would appear to be your present position, and, under the circumstances, I think a gratifying one. (Hear, hear.) The machinery at the mine is very perfect. You have an excellent drawing engine, an excellent crusher, a shaft properly fitted up, cased, and divided; you have the work done on the mine in a very efficient way; your dressing-floors are also fairly good, requiring still some alterations and some extentions in your crushing power and in other matters of detail to enable you to avail yourself of the returns which it is to be hoped will be made this summer. The other great thing to be carried out to make this mine what it ought to be is undoubtedly the completion of the tramway from the mines to the dressing-floors. I walked over the ground a month ago, and I think a tramway, on which you might run light locomotives, which would save you the expense, annoyance, and uncertainty of carting, could be made at a cost of about 3000*l.* When once this suit is settled, and once you get hold of these mines, which the Vieille Montagne Company are so extremely anxious to obtain possession of, a small sum to make a tramway, and carry out the principal works will be readily forthcoming; and I have no hesitation in saying that you will have one of the best concerns which has been introduced to British shareholders. (Cheers.) I should like to read you an extract from the Consul's report of the commerce of Gothenburg during the year 1879, which has been sent to our Foreign Office, and in which our mines are referred to:—

"Of other metals blende, copper, and lead ore figure to some extent. The first-named mineral is chiefly exported to Belgium by the Vieille Montagne Company. There is also an English company (the Hultafall Mining Company), to whom belong some very valuable zinc and lead ore mines adjoining the Belgian property, which though not yet worked or developed to the extent of which the richness of the mines permit, give great hope, as necessary rail or tramway communication has been effected between the mines and the dressing-floors, situated near the shores of Lake Wettern, where there is an excellent sheltered harbour with plenty of water at all times, to become a property of great value. Dulness in the metal trade, coupled with other difficulties of a nature which time and perseverance only can surmount, have prevented these English miners from already attaining a well-deserved success. An unusually early winter, together with a casual scarcity of tonnage for bringing down some large quantities of blende and lead ore from these mines by canal to Gothenburg (already dressed for export), has made a considerable deduction in the figures of export in these minerals. The lead ore produced at the Hultafall Mining Company's dressing-floors from the before-mentioned mines has almost exclusively been shipped to London, where it has found a ready sale. An attempt was made to dispose of this ore to some new native silver extracting works, which had lately been erected in this country, but failed, chiefly owing to the very expensive transit by rail. The ore is rich in silver, and being dressed up to 77 per cent. lead very valuable."

I merely read that to show that your mines are of sufficient importance to have been noticed in the British consul's report on the commerce of that part of Gothenburg. I do not know that I have anything further to say to you beyond that the present expenditure upon your mines is about 200*l.* per pay, the pay being fortnightly, and the agent expects, without further discoveries, to be able to make sufficient returns of silver-lead and blende to pay costs and leave a profit. I need not say that if that is carried out it is a very happy position to be in. Meanwhile the mine will be opened up as rapidly as possible, and I have every reason to believe that before we meet again at the next annual meeting you will have been put in possession of these extremely valuable mines, which are the envy of a good many people, I assure you, in Sweden and elsewhere. (Cheers.) If any gentleman has any questions to ask I shall be happy to answer them to the best of my ability.

The CHAIRMAN, in answer to Mr. LETHBRIDGE, said the question of raising money for the tramway had yet to come before the board, and they would not recommend its construction unless they saw that sufficient profits were coming in to justify its construction.—Mr. LETHBRIDGE said he was pleased the directors took such a cautious view of the matter. He certainly took a much more favourable view of the future of the company.

The CHAIRMAN, in reply to an observation by another shareholder, said he did not know any mine which had made better progress than this had done in the first two years of a company's working.

Mr. JOSHUA MAXFIELD said his brother and himself were doing their utmost to promote the interests of the Hultafall Mine. The lodes on the old mine could be seen. The shaft they intended to work was something like 12 yards deep; it was filled with rubbish, but they knew what was in the bottom. They were going down upon a lode; they had not yet seen it, but it was believed to be 12 or 14 ft. broad, with solid mineral in the bottom, but in the adjoining mine they had worked within 200 yards, spent a good deal of money, and sold mineral from it. The mine would not be an expensive one to work. They could commence getting ore from this mine as soon as it is cleared out. They commenced breaking the ore in sinking the shaft, and all the ore which could be raised from the sinking of the shaft could be brought up by hand winch, and he thought they should receive more money for the mineral than the cost of sinking the shaft. By that time they would be opening out the property, which under judicious management would pay them well. The lawsuits having been so far won, there was nothing to prevent the company commencing work in the mines referred to by the Chairman, and he had the fullest confidence that it would succeed. (Cheers.)

On the motion of the CHAIRMAN, seconded by Mr. MAXFIELD, the report and accounts were then adopted.

On the motion of Mr. TUCKNESS, seconded by Mr. LETHBRIDGE, Mr. Joshua Maxfield was re-elected a director.

Mr. MAXFIELD, in acknowledging the compliment, said that his brother and himself felt that their interests were bound up in this company, and nothing would be left undone on their part to ensure its success.

Mr. Tuckness was then re-elected the auditor.

A cordial vote of thanks to the Chairman and directors closed the proceedings.

CHONTALES CONSOLIDATED MINING COMPANY.

An extraordinary general meeting of shareholders was held at Gresham House, Old Broad-street, on Thursday,

The Right Hon. Lord NELSON in the chair,

For the purpose of considering, and, if thought expedient, confirming the following resolutions passed at an extraordinary general meeting of the company, held at the City Terminus Hotel, Cannon-street, on Wednesday, April 14:—

1. That the company be wound up voluntarily.—2. That Mr. J. Jameson Truran be appointed liquidator.—3. That the liquidator be, and he is hereby authorised to enter into such agreements, and to execute and do all such assurances and things as may be necessary for carrying into effect the following scheme, viz.:—

1.—A new company—to be called the Chontales Company (Limited), or some other suitable name—shall be forthwith formed and registered under the Companies' Acts 1862 to 1879 as a company limited by shares, and with a nominal capital of 125,000*l.*, divided into 125,000 shares of 1*l.* each.

2.—So Soon as the new company shall have been constituted the liquidator or liquidators of the old company shall, in accordance with the provisions of the 161st section of the Companies Act, 1862, sell and transfer to the new company the whole of the business and property of the old company, in consideration of (*a*) 125,000 shares in the new company, with the sum of 16s. credited as being paid up on each share, leaving a liability of 4s. on each new share, to be allotted as hereinafter mentioned, or such less number of shares so credited as aforesaid as may be accepted on allotment; (*b*) such sum or sums of money (if any) to be paid and provided by the new company as may be required for the purchase, under the said 161st section, of the interests of dissentient members of the old company, and (*c*) such further sum in cash as shall be sufficient to pay in full all the debts and liabilities of the old company, and the costs and expenses of winding it up. The new company shall also as a part of the consideration for the said sale, indemnify the old company and the liquidator or liquidators thereof against all liabilities of the old company, the costs and expenses of winding it up, and all claims and demands in respect thereof.

3.—The said 125,000 shares, with the sum of 16s. credited as paid up on each share respectively, shall be allotted to and divided amongst such of the shareholders of the old company as assent to this scheme, each of such shareholders being entitled to receive two of such new shares for each share held by him in the old company. So many of such new shares as shall not be accepted by shareholders in the old company shall be allotted or dealt with by the new company as they shall see it.

4.—The objects for which the new company is to be established shall be stated in the Memorandum and Articles of Association thereof in such terms as shall enable the new company (in addition to the objects for which the old company was formed) effectually to carry out this scheme; and the Articles of Association shall contain a provision that after the first 2s. per share shall have been called future calls shall not exceed 6d. per share, or be made at intervals of less than three months.

Mr. J. J. TRURAN (the secretary) read the notice calling the meeting, and also the resolutions (given above) proposed to be passed.

The CHAIRMAN said the present meeting was called for the express purpose of confirming the resolutions which had been read, and which were passed at the extraordinary general meeting, held on April 14 last. What the shareholders had to do was simply to accept or reject those resolutions, which were very carefully considered at the last meeting, when certain amendments were made in the resolutions then submitted, and those amended resolutions were passed, and, as he had said, now submitted for confirmation. After the formal business was concluded he should be happy to give the shareholders what information he possessed relative to what had been done towards the formation of a new company, and the latest information which had been received from the mine. He moved the confirmation of the first resolution.

Mr. PARKE PITTAR seconded the resolution.

Mr. PALMER, of Bristol, opposed the resolutions, on the ground that there was really no occasion for such a course. He read extracts from the directors' and Mr. White's report, and contended that the promises held out in those reports had not been fulfilled. He also complained that there had been great delay in sending out the machinery which had been ordered from time to time, and that the stores sent out had not been bought in the cheapest market.

The CHAIRMAN said the resolution to wind-up was justified in this way—that the company was in such a position that it really could not have been kept afloat had it not been that the gentlemen who attended the meeting which was summoned had nobly come forward, and took up and paid almost on the moment 1000*l.* worth of debentures, without which they could not have gone on with the company. It became evident that the only thing to do was to wind-up the company voluntarily, and to start a new company. At that meeting it was suggested that a meeting of 24 of the largest shareholders should be summoned; this was done, and it was decided that the company should be wound-up, and reconstructed in the way proposed He might mention that Mr. Palmer and the Bristol shareholders took up but very few of the debentures, and in consequence of not having that money the mine could not be opened up in the way the directors wished it to be. As regarded the stores, the directors did all they could to keep a proper stock of things at the mine. He might mention that one of the advantages of the new company would be that there would be new names on the direction.

The resolution was put and carried, Mr. Palmer and another gentleman voting against it.

The other resolutions given above were then proposed by the CHAIRMAN, seconded by Mr. PARKE PITTAR, and carried, only Mr. Palmer and another gentleman voting against them.

The CHAIRMAN said he would say a few words regarding the progress made with the new company. On the 3rd of May the directors met, and they called in the advice of Mr. Albert Creak and Mr. Baxter, who went with the directors through the Articles of Agreement of the new company which had been drawn up. It was stated at the last meeting that the board of directors were perfectly willing to make room for two others. Col. Perceval, from ill health, had expressed a wish to retire, and Mr. J. O. Hanson had also stated that he could not act on the board of the new company, and the board hoped that in the place of these two gentlemen they had secured the services of Mr. Baxter and Mr. Albert Creak, both of whom were well-known gentlemen, and the directors believed would forward the interests of the company. By the Articles the board must not be less than four nor more than seven, but at present the directors thought that five would be the best number. The directors had pledged themselves that they would get an independent opinion on the spot regarding the mines, and were now engaged in selecting a gentleman for that purpose. The board were proceeding with the reformation of the company and all the other arrangements as expeditiously as possible. He would now read the following extracts from the latest reports from the manager of the mine.

April 6.—During the month 790 tons were raised from both mines. Total quartz treated at the stamps 740 tons, which produced 151 ozs. of gold, or an average of 4 dwts. per ton, and which leaves 50 tons of hard quartz now at the stamps for the stone-breaker when there is sufficient water. Value of the gold, 410*l.*; total cost for March, 340*l.*; profit on the month, 70*l.*—Mines: San Sebastian: During the past month we have holed the new rise, and brought to the stamps 194 tons of manta, worth on an average 5 dwts. per ton. I cannot yet calculate on the quantity of quartz the manta may produce, but believe we have sufficient to continue profits during the dry season. The manta and new rise are north of the old workings in back of the main level, and, therefore, cannot be shown properly on the section, but would appear as if mixed up with the old workings.—Estrella: Rose in western rise 13 varas, and holed to surface. Stoped from No. 1 stops 173 varas. Drove main level 8 varas; lode 3 ft. wide, worth 4 dwts. per ton. Total quartz raised from Estrella during the past month is 672 cars, or 595 tons, worth on an average 4 dwts. per ton. The machinery and mines are kept in the best working order, and now with the manta from San Sebastian we shall be better able to compete with the dry season, and with the hard quartz from Estrella. The lode in Estrella going west is generally hard, but contains gold throughout, and is interspersed with small deposits or pockets

of rich quartz, which I think will make the lode pay by continuing to open the mine during the dry season, so as to have a better chance to raise average quartz from the stopes to supply the stamps when the wet season again sets in; hitherto we have been very contracted in our stoping ground, partly from want of funds, and by means of the lode falling off in San Sebastian, but our prospects now are much improved by the manta, with which I think to be able to keep up our profits during the dry season, and by opening out a good length of stoping ground in Estrella (which is now in progress) will continue our profits during the coming wet season.—WM. WHITE.

The meeting then broke up.

SANTA BARBARA MINING COMPANY.

The eleventh annual general meeting of shareholders was held at the offices of the company, Liverpool, on April 30,

Mr. J. H. DENNIS in the chair.

The SECRETARY read the notice convening the meeting, and the minutes of the preceding one, which were confirmed. The report, of which a full abstract was inserted in the *Mining Journal* of April 24, and statement of accounts, were taken as read.

The CHAIRMAN, after alluding to the temporary indisposition of the chairman of the company, which prevented the latter's presence at the meeting, said he did not consider it was necessary for him to enlarge on the directors' report, which went as usual very fully into the operations of the company during the year under review, and the prospects at the mine. He referred with deep regret to the decease of their late manager at the mine, Mr. Hilcke, who had so energetically and worthily fulfilled his duties and striven for the interests of the company, and they had no doubt suffered a loss by his death, but on the other hand Mr. Thomas Tregellas, who had temporarily taken charge at Pari, had been a worthy successor, and done well for the company. The results for the whole year were, he considered, very encouraging for the future. Nothing had been finally decided on with regard to the new capital required for the new works, as the money was not wanted just yet. The board had appointed Mr. W. H. Richards, whom they considered fully qualified for the post, the superintendent at Pari, and the directors hoped and believed that his services would prove of great value to the company. Mr. Richards would arrive at the mine some time before the departure of Mr. Tregellas, and consequently would be able to confer with the latter, and receive information from him concerning the administration of the company's affairs. He would conclude his brief remarks by moving—"That the report of the directors, with statement of accounts for the year ending Dec. 31, as presented, be and is hereby received and adopted, and that from the balance at the credit of profit and loss, the sum of 500*l.* be placed to reserve fund, and a further dividend of 2s. per share for the year 1879 be declared, payable on May 20."—Mr. C. F. CARNE seconded the resolution.

Mr. WILLIAMSON asked if Mr. Richards had experience of mining in Brazil? He wished further to know in reference to the falling off in the profit reported for last month (February) owing to the poorer quality of the lode in the southern section of the mine, which he hoped would not prove continuous, whether there was any improvement in the northern part of the mine.

A SHAREHOLDER expressed a desire to see a plan of the mine workings when such could be prepared.—After a few other remarks from shareholders, the CHAIRMAN said that Mr. Richards had been connected for a number of years with the St. John del Rey Company at Morro Velho, and no doubt was possessed of considerable experience as regards mining in Brazil. He thought that the falling off in the lode at certain places was only for the time being, but he looked upon the bottom as the future of the mine, for it appeared that in depth the lode became wider and more auriferous. As compared with two or three years since there was no doubt an improvement in the lode north of No. 1 shaft, and the probability was that the future workings would be chiefly carried out in this part of the mine rather than to the south of the shaft, where the lode had been disordered of late. After replying to other questions he (the Chairman) put the resolution to the meeting, and it was carried unanimously.

Resolutions were then passed unanimously re-electing Mr. J. H. Dennis a director of the company, and Mr. A. W. Chalmers the auditor.

In supporting the passing of a resolution that the best thanks of the meeting be given to Mr. Thomas Tregellas and the staff at Pari for their exertions in the interests of the company for the past year, Mr. WILLIAMSON said that their special acknowledgements were due to Mr. Tregellas for his consenting to go out to the mine, and for his successful endeavours to improve the yield of gold from the ore.—The proceedings closed with a vote of thanks to the Chairman and other directors of the company.

MECHERNICH MINING COMPANY, RHENISH PRUSSIA.

The annual meeting of shareholders took place in Cologne, on April 29. The CHAIRMAN, in giving his report, said: You will see from the balance which has, as usual, been made up on the soundest principles, and has been found correct by your auditors, that the result of 1879 must be called a favourable one, considering the low prices of lead during the greater part of the year. Guided by the conviction that writing off liberally is necessary to the consolidation of our business, we have done the same as extensively for the past year as in former years. We considered this the more necessary, as large quantities of lead have still to be delivered in the course of this year at low prices, according to old contracts, and as we are also afraid another fall in the price of lead may be possible. After writing off 896,639·62 marks, there remains a clear profit of 659,705·91 marks, out of which, with the addition of the reserve dividend, we propose to declare a dividend of 8 per cent. for 1879.

The balance still shows the capital as 9,600,000 marks, with a reserve fund of 960,000 m. For new buildings and buying new machinery, &c., 38,824·65 m. have been expended, whilst on the other hand there have been written off 803,795·27 m. depreciation from property and plant account. The stocks of ore and metal amount to 630,862 m., and cash, bills, and investments to 615,758·68 m. The gross profit (including a balance of 5866·30 m. from last year) is 1,556,345·53 m., and after deducting amount written off as above, leaves a clear profit of 659,705·91 m.

Dr. BALANCE.			
Mining property, balance 1878	Marks	6,500,524·81	
New works in 1879		23,467·66	
		6,523,992·47	Marks.
Written off		650,000·00 =	5,873,992·47
Ground property, balance, 1878	Marks	936,391·23	
Addition in 1879		641·66 =	937,032·89
Offices and workmen's dwellings	Marks	310,175·00	
Written off, 6 per cent.		18,611·00 =	291,564·00
Smelting works, 1878	Marks	320,686·00	
Addition, 1879		2,468·24	
		323,154·24	
Written off, 15 per cent.		48,473·24 =	274,681·00
Railway property			876,607·00
Machinery, 1878	Marks	1,093,345·39	
Addition, 1879		12,888·75	
		1,106,234·14	
Written off		86,711·03 =	1,019,523·11
Debtors			786,818·73
Materials, wood, magazine, &c.			361,581·89
Stock of ores and metal (after writing off 92,844·35 m.)			630,862·00
Cash, bills, and investments			615,758·68
Total	Marks		11,718,421·77
Cr.			
Capital	Marks		9,600,000·00
Creditors			348,715·86
Reserve fund			960,000·00
Dividend, reserve			150,000·00
Profit—balance 1878	Marks	5,866·30	
Profit, 1879		1,550,479·23	
		1,556,345·53	
Written off as above		896,639·62 =	659,705·91
Total	Marks		11,718,421·77

The MANAGING DIRECTOR said: Gentlemen, commencing with the commercial part of our undertaking, I call your attention to the statement in my last report which referred to the then existing improvement in the price of our principal product—lead. The price of lead after rising during the first quarter of the past year from 25 m. to 28½ m. per 100 kilos., fell again up to July to 25 m., and even 24 m. In August it commenced to rise once more, and reached its highest price, 36½ m., towards the end of 1879. At the beginning of this year the price fell back to 32 m., and is now 34 m. At the London Metal Exchange, which may be looked upon as the safest barometer for the prices of lead in the commercial world, the same change took place, but prices there were even more depressed, owing to the considerable importation from Spain and the diminished exportation of English lead to China and Japan, which markets were partly supplied by America and Germany. The average price there was in January 14*l.* 5s., July 13*l.* 10s. 11d., December 18*l.* 12s. 6d. Similar changes took place at Rotterdam, where the price in January stood at 8 fl. to 8½ fl., rose in March to 9¼ fl., to fall again in August to 7¼ fl. Then followed a slow but steady improvement, so that in the beginning of December large quantities were sold at 10¾ fl. In consequence of these considerable changes in the price of lead we have not always been able to profit as much with the sometimes high prices as we would have wished, nor will these high prices, which existed at the beginning of this year, and may possibly return in the course of same, materially influence the result of our business. This fact, as you will have seen, gentlemen, by our former reports, is owing to the peculiarities of our mines, which require a certain mode of realisation of products, and differ in position from nearly all lead producing mines. The daily production of 1000 cwts., which if stored away would soon accumulate to a considerable quantity, makes it desirable, and from a financial point of view even necessary, to provide for a regular sale through contracts for forward delivery. In carrying this out we are fortunately able to obtain nearly the entire ore for our production of lead from our own mines, whilst other smelting works in Rhenish Prussia, although producing large quantities of lead, are obliged to buy either the whole or at least three-quarters or two-thirds of the ore they require, and are, therefore, in reality no lead producers at all, or only partly so. The working of our lead mines admits of a closer calculation of the cost price of our lead, and enables us by a certain offered price to fix an accurate future profit. We thus provide a sure profit by making timely contracts for forward delivery, in mutual good faith, mostly with foreign houses of good standing. The ruling price of the day can serve as a basis only for the least part of our production, which is not sold for forward delivery, and is also with us partly obtained from ores bought at the then ruling price. It is, of course, natural that in making contracts for forward delivery the consumer tries to buy at the lowest price, whilst the producer wishes to await the most favourable moment, in which, however, he seldom succeeds. It may happen that the producer after carefully considering all circumstances will enter into a contract just before the prices take an unlooked-for favourable turn, and thus loses the opportunity of multiplying his profit by not selling at the advanced price. Your directors are, however, by your former resolutions convinced that by thus disposing of the greater part of our production they still meet with your unremitting approval, because even with the many changes in the price of lead we are thus enabled to ensure a certain, though not exorbitant, profit, and to render our business to the same good account as we endeavour to do with the technical part of our undertaking, and, as we believe, with good result. From the fact that we made a profit of only 256,073·75 marks less than the year before, when the average price was much higher, you will see that we succeeded in increasing our production and reducing the cost price by great economy by developing the working capacity of our miners and by constantly improving our works. With regard to the latter points, we must also in future not fear those expenses which are requisite for increasing the working capacity, and which by the continual technical progress are forced upon us as well as upon other similar establisments wishing to be able competitors. With regard to trade in German lead I find no alteration from what I stated in my last report. With the exception of our company the trade was almost entirely in the hands of the few known German dealers, who continued their speculations to their own interest, but to the disadvantage of producers and consumers. Although this evil circumstance has been acknowledged on all sides, and many have tried through the Press to remove this injurious indirect dealing, the German lead producers have, as yet, come to no agreement to oppose the same. You will have seen the financial state of our undertaking from the balance sheet, of which our president has given you full particulars, and I only wish to add that we have written off the stock of ores and metal 92,844·35 m., by which the value of same has been reduced to about 12 per cent. under cost price, at which they, according to our statute, should have appeared in the balance. The working capital is formed by the difference between the accounts of debtors, stocks, cash, bills, and investments, amounting in all to 2,445,021·30 m., and the account of creditors amounting to 348,715·86 m. We have again been fortunate to sustain no losses in 1879. To speak of the mining itself, I have to state that the mining was confined to the concession of Meinerzhagen Bleiberg, but was carried out as extensively as the number of skilful miners would admit. The production of 1879 consisted of 521,849 cwt. lead ore, and 22,854 cwt. pottern ore, together 544,703 cwt. At the works of the company altogether 654,199 cwt. of lead ore have been smelted, and for that purpose 11 roasting furnaces and 6-7 blast furnaces were kept going. The ore smelted during last year yielded 333,840 cwt. of soft lead, and the quantity produced from our own ore amounts to over one-fifth of the entire lead produced in Germany. We sold in 1879 330,293 cwt. of soft lead, 23,340 cwt. of pottern ore, and 5086 kilos. (about 11,213 lbs. English) of silver. In the number of workmen no material change has taken place, and there were on an average 3170 men employed during the last year. The companionship of our miners numbered this year 1108 permanent and 2046 temporary members. The pensioners of same were—71 disabled miners, 145 widows, and 235 orphans. The income amounted to 81,709·60 m., and the expenses to 81,127·09 m. The capital of the companionship stood at the end of the year at 142,013·26 marks.

THE MONA MINES.

The ordinary general meeting of shareholders was held at the offices of the company, Austinfriars, on Thursday,

Mr. W. BRUCE DICK in the chair.

Mr. W. J. LAVINGTON (the secretary) read the notice convening the meeting.

The CHAIRMAN said: Well, gentlemen, I have very few words to say to you, as those I see around me are very well conversant with the workings of our mine, but I am proud to be in a position to congratulate the whole of us. (Hear, hear.) I am sure I never attended a meeting in which I was able to rise to make such a satisfactory statement to the shareholders as I am at the present moment. It is but a few months since this mine passed into the hands of a limited liability company, and I will put before you a very short statement, and when I put that before you I think you will not ask for many more remarks from me. At many meetings the Chairman is obliged to say, and is glad to say, something to pacify shareholders; but I am going to put figures before you and actual facts, and I require no flowery language to cover any shortcomings or disappointments that shareholders very often experience. (Hear, hear.) It was about five months ago that this property came into the hands of the present shareholders. (Mr. BATTERS: Not four months?) Four months—I am glad you have corrected me. Since that time we have sold of regulus 25 tons 15 cwts. 1 qr., realising 953*l.* Of plumbiferous blende—I will give it its proper name, and will not call it bluestone—we have sold 1683 tons, realising 2500*l.*—(Hear, hear)—of ochre, 489 tons, realising 868*l.* 9s. 8d.; of pyrites, 119 tons, realising 63*l.* 16s. 1d., and of solder—I was not aware that there was a mine yielding solder, but Mr. Evans is a wonderful man, and has discovered it in this way. A lot of tinware had been put into the pits to pass the water over, and this has produced a solder which the little girls have picked. This has been sold, and has realised 37*l.* 6s. 8d.—in all, 4023*l.* 2s. 9d. We have on hand at the present moment, in stock—though the bulk of this is also sold, but is waiting shipment—of copper ore 400 tons, which Mr. Evans puts down at the moderate sum of 1000*l.* It is more likely to realise 1400*l.*; but we want to keep within the mark. Of regulus we have 90 tons finished, which we put down at 2700*l.*—that is considerably within the mark, gentlemen.

Mr. SINCLAIR: That is taking the regulus at 30*l.* per ton, and you got 37*l.* per ton before.

The CHAIRMAN: Yes. Of ochre we have 800 tons, which we have put at the modest sum of 1200*l.* Of bluestone, or plumbiferous blende, 900 tons. That will make 5800*l.*, keeping well within the mark. That is 10,023*l.* Well, I will astonish you. That has all been realised at a cost of 3223*l.*—(applause)—leaving a net profit of 7000*l.* These facts require no flowery language, for a more satisfactory statement was never put before shareholders.

Mr. SINCLAIR: We have a good manager, that is the reason.

The CHAIRMAN: I hope we may be spared to meet very often, and that I may be in a position to present as flourishing and rosy a statement as we have to-day. But I cannot resume my seat without complimenting Mr. Evans, who is a most able man, and he is very ably assisted by Mr. Painter, who has come from Anglesea to attend this meeting. I hope they will be long spared to perform the duties they so well performed since we made acquaintance. (Hear, hear.) I shall be happy to answer any questions which may be put about money matters or about anything else.

Mr. SINCLAIR: Your statement is so flourishing that I should like to ask when do you propose to pay a dividend?

The CHAIRMAN: We may give an interim dividend at a short date, but we do not want to commit ourselves. (Hear, hear.) You see our position, and can draw your own inferences.—Mr. SINCLAIR: You say that a lot of the stuff put here in stock is sold?

Mr. EVANS: The regulus we can sell at any moment. The copper ore is principally sold. The ochre is under order, the greater part of it is under order to good customers, and the plumbiferous blende is all sold.

Mr. GUTIERREZ: Can you sell as much ochre as you can produce?

The CHAIRMAN: No. We produce ochre in such large quantities; we have it, in fact, *ad libitum*.

Mr. EVANS: This is the position of affairs regarding that matter. We can sell all the superior qualities of ochre produced almost as fast as we can get it ready for the market, but we have some little difficulty with respect to the inferior qualities, more especially the sulphide-oxides used in the manufacture of gas. That is a department we must pay greater attention to in future. I think with proper management, and by pushing the sales, we might get a very considerable quantity sold, which would be in addition to the present sales. We have an unlimited supply. It is a mere matter of sale.

Mr. G. BATTERS: I think, gentlemen, the statement made by our Chairman with regard to the results must be very gratifying to all of us, but I should for myself be pleased to hear what our manager has to say with regard to the prospects for the future. (Hear, hear.) A mine does not live upon the results of three or four months' working. What we have to look to is the future. To me the figures are very extraordinary. The sales of ochre are most satisfactory; the sales of blende are most satisfactory; the sales of copper are most satisfactory; but what I want to know is the source from whence this stuff can come, and whether we have a prospect of having a good bank to draw upon in the future? I do know this, that when the company took possession of the mine—three months and a fortnight ago—the returns of copper ore were then about 40 tons a month, and I note that during the last month there has been raised 240 tons. And a not less satisfactory feature is the quality of that ore. Hitherto the produce of Mona Mine copper has been comparatively low; but as depth is attained in the workings the quality improves in a very marked degree. The produce of the ore now being raised is upwards of 6 per cent., comparing favourably with any of the great discoveries of copper that have ever been worked in Cornwall. The sources of these great returns are chiefly from the 55 fm. level, but in the course of four months time the 70 will be brought out under this point, and which will enable the management to double the returns. Not only is this an important feature, but the fact that in the shallow workings, where its present discovery is made—extending certainly to a proved length of about 90 fathoms—we have every reasonable expectation of this course of ore extending for that length, how much beyond is to draw upon the imagination, or for hundreds of fathoms in extent, our manager tells us, we have no cross-course or break to check our onward progress. The surprising fact in the workings of this mine is that for this great length of ground there has been little or nothing done under 20 or 30 fathoms, excepting in one place, where the lode has been followed down to a depth of 90 fathoms, leaving an amount of work done for our company which would have taken many years to have accomplished, and which we can step in to the fruition of in working in a comparatively brief space of time. I see no reasonable ground to doubt that the Mona in future will be quite equal to the Mona of the past. (Hear, hear.) The figures which have been given with regard to the past are so overwhelming that one can hardly realise them. It is said—mark, it is said—that somewhere about 15,000,000*l.* have been realised in profits from the working of these mines, chiefly from the open-cast, a deposit apparently similar in character to what the Rio Tinto Company are now working in Spain. It is impossible that open-cast workings can be carried on to any indefinite extent, whether in slate quarrying, in metalliferous mines, or in coal getting, and as a matter of course they had a run which deprived them of their mines—that is to say, a fall of earth closing up the open-cast workings, requiring them to move a perfect mountain of debris before they got to the workings—by a tunnel under the work and mining in the ordinary way; so the only means they had of recovering their mine must have been sinking. Levels are now being driven under these great open-cast workings, and from the latest appearance of these workings the deposits are opening up in width, developing what has been worked away as open-cast in the past, for us now to tunnel away as open-casts, but by tunnelling and stoping in the ordinary mode of extraction of metals from odes. When these levels are extended, when this course of ore is laid open, it is not much to expect a return of 1000 tons a month. We are already getting 240 tons, the result of a very few months working. When the 70 is brought up we hope to double our returns, and give Mona a few years time to lay open those immense resources, and I can see no reason why Anglesea should not rejoice in the greatest mine in Great Britain—(hear, hear)—as far as productiveness in copper is concerned, and the realisation of profits. That mine must be a cheap wrought mine when you consider the monthly costs here are far under 1000*l.* But what is necessary to be done now is to lay out money to lay open the mine, and to lay it open in as expeditious a manner as possible. Money for the purpose is being provided. A very large sum of money is now lying on deposit, which if spent in explorations would result, no doubt, in giving you a mine of the character which I have indicated, and which your plans here on the table prove to demonstration. You are not wholly dependent upon copper, but no doubt the Mona Mine is a copper mine. You must look to that as your mainstay and your backbone. You have the means of returning the copper to the best possible advantage. You have smelting works. There have been located alongside of you, occupying a portion of your smelting works, sulphur works, and you have the advantage that the sulphur is extracted from the ores raised from your mines; money being also paid to you for that privilege being accorded to the sulphuric acid manufacturers, and your ore is returned to you in a better state for smelting than it was when you lent your ores to these people. Not only do you send away your ores reduced to regulus, and in a more concentrated and economic form both for carriage and for everything else, but you have in the management here, in the late managers of the mine, in our esteemed friend Mr. Evans, late Her Majesty's Inspector of Mines, who has tendered his resignation to take the management of these mines—(applause)—a negation, apparently, of self, a sacrifice we can hardly understand, holding, as he did, so proud a position as Her Majesty's Senior Inspector of Metalliferous Mines of England, to take the management of the Mona Mines (Limited); but here is the fact staring you in the face, demonstrating the fact that he must see permanence in these mines, otherwise he would never have sacrificed himself by leaving such an appointment to take this management. (Applause.) You have, then, the means of returning your copper ores in the most economical way, and you have secured possibly the best management in the kingdom, and after all everything depends upon management. But you have here a model company, in the inception of which there has been nothing but the most straightforward conduct which is possible to be instituted in the inauguration of a company. There are 8000 shares of 5*l.* each, 20,000*l.* of which was paid down and paid into the bank—a tolerably good working capital—so that you may almost say (in fact, you may truly say) that the capital of the company is nominal, and does not in the smallest degree represent the value of the shares or the value of the company's possessions. Not only have you copper, but you have here this plumbiferous blende that we hear so much about, but which it has been a little difficult to sell up to the present time, and a very large sale has been effected, covering the produce of the mines for the next two years, and at a remunerative price. The ochres, on which we placed little or nothing, have been sold to an extent that would go far towards covering the working costs of the mine. We do know that the resources of our ochre supplies are almost unlimited. (Hear, hear.) I have said, I think, enough of the prospects of the mine, but I should like to hear what Mr. Evans has to say; and as the plans are on the table that he should offer to us, and we should hear *viva voce*, his opinion as to the probability of these discoveries now made extending lengthwise and also in depth. (Applause.)

Mr. EVANS: Mr. Chairman and gentlemen, I think I have a slight cause to complain of the terms and tenor of Mr. Batters' very able and very interesting speech. He started by suggesting certain questions that it was desirable I should answer, but instead of waiting for my reply he proceeded to answer them almost *seriatim* himself. (Mr. Batters: "No. no.") However, there may be a few remarks to which it may be as well to refer on the points raised in Mr. Batters speech. In the first place, he opened his remarks by referring to the very great increase that has taken place in the returns of copper ore. He said—and, I think, said with accuracy—that the returns when the transfer took place from one company to another amounted to about 40 tons of ore per month, and at present they amounted to about 240 tons per month. That is perfectly correct. Now, an impression might be formed from these two statements that since the formation of the new company an effort has been made to increase the returns of ore by straining the powers of the mine by taking out the ore with undue haste. Now I can assure you—I give you my word—that no effort of the kind has been made. It has been purely the result of discoveries which have been made since the inception of the company. The old company had discovered the lode, and had entered upon this orey deposit, and I assure you that they had no conception of the value that it has now developed when they handed over the mine to you. It has increased in value day by day, and when I left home the day before yesterday it looked better than at any previous time. (Hear, hear.) The end going east is still in good, strong orey ground; and, as I have already explained to some of you, the map that lies upon the table shows that eastward of that end there were very extensive workings down to the 30, and the old records of the mine prove that these workings were profitable in the same place—highly profitable—and it is only a very fair inference that as we proceed eastward we shall encounter the same changes in the ore at greater depth; and as regards the distance to which they may be found eastward, I have only to remark that they have been worked in the bluestone shaft a distance of I should think 150 fms. (Hear, hear.) In the furthest point eastward reached by these levels the best deposits of ore were found, both of copper ore and bluestone, or plumbiferous blende, as you might call it. Well, that I think speaks volumes for itself as to the lasting nature of the mine in this portion of the sett. But at the 55, the principal seat of our present operations, the ore there shows every appearance of widening as it goes down. It would appear as if we had just entered upon it on its very roof. It spreads downward. In the 48 above we found ore certainly, but in very small quantities, and nothing like what has been discovered in the 55. Proceeding eastward from the 55 to the Cairn shaft, which is about 90 fms. from it, we came again to a large deposit of ore which that shaft intersected—that is a little below the 44, and it continued in ore until the sinking was suspended a few years ago. The shaft was still in ore when it was suspended; and the only reason for stopping was that the water was rising faster than we could draw it, and the old company had to make arrangements for setting pitwork in the shaft. They set pitwork and constructed a powerful windmill for working the pumps, and if the wind had always held that windmill would have been an efficient power; but, unfortunately, we had calm weather, and when the mill stands still the water rises, but now we have efficient pumping power, and we shall soon begin the operations there again. With reference to the sources of the various products explained by Mr. Batters, I would explain that the regulus is the product of the smelting of the ores, and that will continue while we have any ores to smelt, as well as the precipitate, the ores being first calcined, and the precipitate put in in the condition in which it is brought from the pits. Then as regards the bluestone, I have only to say that the three places from which we obtain the present returns look remarkably well. The third place was only discovered about a week ago, and from the appearance now presented, and the quantity of stone already brought up, I think we have here a very large store of this material in the bluestone shaft.

Mr. SINCLAIR: At what depth?—Mr. EVANS: At about 22 fms. from surface.

Mr. GUTIERREZ: Have you got through the lode?—Mr. EVANS: It is not a lode, and I would explain that the great open-cast so formed was one for working the copper. The bluestone was then worthless, and was left there, and the whole ground fell in together. We have seen into this, and there we have found enormous large stones of bluestone. The old miners left it there. So far as the bluestone is concerned there is every prospect of our having very large and very lasting supplies. Then we come to the ochre. As I explained before, in answer to the question of a gentleman present, the quantity of the best qualities of ochre is limited by the quantity of water that we treat for precipitate of copper. At present that shows no signs of diminution; on the contrary, I think we shall have richer water as we develope that portion of the mine we are now working at the 55; for the water for the southern portion of the mine always contains a great deal more than is contained in the water obtained from the northern portion of the mine; and I think in future our precipitate will be larger in quantity and large in produce, and also larger in the amount of copper. With regard to pyrites I may tell you that the amount we have been raising for some years past has been very small. We have given no attention to that portion of the mine, for the simple reason that the foreign pyrites come in so cheap that there has been a difficulty in selling it to chemical manufacturers except at prices at which we should not care to press sales. The excellent way in which the solder is procured has been explained by the Chairman. The oxide of iron, as I have already explained, is in unlimited quantities. It has been formed in bygone days by the water in the mines—bog ochre as it is called—which is used for gas purification. We only want a large quantity to make good prices.

Mr. SINCLAIR: What prices do you get?—Mr. EVANS: We get 12s., 18s., and for some as much as 30s. (and even 40s.) per ton.

Mr. SINCLAIR: You raise very cheaply I suppose?—Mr. EVANS: Yes; it is at the surface, lying at the side of the mine prepared—partly on the farm ground. Then, as I have already told you, this very extensive sett affords room for two or three, or even half-a-dozen, mines; but it would not, perhaps, be desirable to have many mines working in the same sett. It may, however, be a matter for consideration hereafter whether you might not set one portion of it—(hear, hear)—as there are most promising indications of metalliferous ores in many places, and I can only add to what the Chairman so aptly and so eloquently put before you that no shareholders had I think ever greater cause for congratulation than you have. I think you have a very valuable property, and it is a very high gratification indeed to me to be associated with you in this company.

Mr. GUTIERREZ: I should like to know what cash we have in hand, and the total available assets?—Mr. BATTERS: You can see the cash-book if you like; but I may say we have quite enough for our wants, and a little more.

Mr. EVANS: I should like to add one word more. I know there was a wish on the part of the directors that further explorations should be made, and that we should spend the money now lying in the Bank on deposit. At present I hardly think it would be judicious to spend any more on trials, but when the engine is put up, and the mine is drained to the 80 fm. level, there will be ample room for any amount of exploratory trials. Then the money will stand us in good stead.

Mr. SINCLAIR, in the course of a few remarks offered as a non-practical man, said: I formed one of a deputation of the directors who went down to see the mine, Mr. Batters having so urgently put the matter before me that I was induced to venture into it. I remember that when we got to the summit of the Mona hill I was never so much surprised before as I was then, and I said, "We have paid 20,000*l.* and we have got nothing but ruins." (Laughter.) The evidence was that of a great casualty in bygone time, and I felt my heart beat "pittety-bob" a little bit; but I felt there must be something below. I like to exercise a little faith, and I made myself believe that we possessed a splendid property, and I must say that the mine is one of the most interesting sights you can possibly see. (Hear, hear.) The only parallel I can make to its outside appearance is that of the ruins of Egypt or Palestine, and you cannot help looking about to find Jeremiah wailing for Jerusalem—(laughter)—but instead of lamenting Jeremiah you find Mr. Evans full of energy and activity, and if you are a strong man you may follow him, but if you are not then you must just go after him quietly, for he is a most energetic man. (Applause.) The extent of our property is something wonderful, and I must say that the results have proved everything that Mr. Batters and Mr. Evans said. I have now confidence in the mine, and I think we may congratulate ourselves that we are shareholders in such a mine. Mr. Sinclair expressed the hope that the shareholders in want of a holiday resort would go to Amlwch and visit the mine. They would find the visit a very interesting one, and Mr. Evans and Mr. Paynter would devote some time to them, and give them any amount of hospitality that poor humanity could stand. (Laughter and applause.)

Mr. BATTERS: I think, Mr. Chairman, it ought to be stated that the shareholders resident in Anglesea retained half of the shares of the company. That shows their faith in it. (Applause.)

In reply to a question, Mr. EVANS pointed out that it would not be desirable to

construct a tramway for the carriage of the ores, as the sources from which it came were so widely apart.

A cordial vote of thanks was passed to the Chairman, the directors, and to Mr. Evans, the manager, and the meeting then closed.

WEST VOR MINING COMPANY.

The following report from these mines was submitted to the shareholders at the annual meeting, held last week:—

May 8.—During the past year we have communicated the new shaft with the rise above the adit level, on the Great Vor lode, since which we have been engaged in enlarging the rise suitable for an engine-shaft and drawing purposes, &c. In a few days we shall have it complete from the surface to the adit level, a distance of 30 fms. We have also sunk the shaft 4½ fms. below the adit level on the course of the Vor lode, which materially improved as we got deeper, but were obliged to suspend operations in consequence of an increase of water, which we found too much to contend with without machinery. We have driven the adit level several fathoms east of the cross-cut, both in the Vor and Sozen lodes, and also sunk a winze near 5 fms. below the adit level, on the Sozen lode, in which we found good tinstuff, but here, as well as at the shafts, we found too much water to contend with, and were obliged to abandon it in consequence. I may again say that the principal feature of the mine is the intersection of the two lodes in depth, which will take place 40 fathoms below the adit level, a point I am very anxious to see, as the same intersection in the adjoining mine, Great Wheal Vor, laid open a continuous course of tin for over 200 fms. in depth, and to a great extent both east and west, and I see no reason why a similar deposit of tin should not be found here, the stratum being the same; this could be proved for a small sum of money. A 30-inch rotary engine would be sufficient for pumping purposes, and both engines and pitwork are cheap to buy. I estimate 2000*l.* ample to reach the junction of the two lode, where we could not fail to attain success.—S. HARRIS.

[For remainder of Meetings, see to-day's Journal.]

CWM PRYF MINE.—SPECIAL REPORT.

May 11.—For work done previous to Feb. 23 last I beg to refer you to my report of that date, since which we have stoped a piece of ground for about 5 fms. long, and about 10 fms. from the present forebreast, on the south lode, by four men. This stope has been worth on an average 18*l.* per fathom, and its present value I estimate at 20*l.* per fathom. There was a rise put up to the west of this stope for 12 fms. high, and to the west of this rise we have a stope over the deep adit for 10 fms. long that is worth for lead ore 15*l.* per fathom; this is on the south lode. Over this stope, also on the south lode, we have a rise gone up 8 fms. over the midway level, carried 12 ft. long, and worth for lead ore for that length 30*l.* per fathom. In the deep adit, about 15 fms. from the present forebreast, we found a cross-cut driven north-east 8 fms., with the evident intention of cutting the main lode; this cross-cut has been continued to a distance of between 12 and 13 fms., and has intersected the main lode, so that all doubt about this matter is now removed. We have not yet cut through it, and therefore I cannot speak of its composition, but shall be able to do so at our statutory meeting to be held on June 1 next. From the western stope in the deep adit level it appeared to me that the main lode was standing to the north of the level, and I, therefore, determined to cut north into the eastern end of this stope, where the vein has made a sudden bend in that direction, and where we found it worth 15*l.* per fathom. This being the case we determined to run up an inclined rise on an angle of 30° towards the midway level, and this incline has now gone forward 5 fathoms on good ore, and is worth 13*l.* per fathom. The fact of finding the main lode in this stope and in the eastern cross-cut establishes beyond any doubt that the main lode in the deep adit has never before been touched beyond the western stope. We have a cross-cut in the deep adit now in nearly under this ore in the incline rise, which we shall continue and hole to the rise shortly, and then drive the deep adit on its course. In the midway level, about 15 fms. east of the incline going up from the deep adit just described, we have put up an inclined rise on the main lode, between 16 and 17 fathoms towards No. 2 adit, and we are expecting daily to hole to the same; this rise has passed through ground varying in produce from 15*l.* fo 40*l.* per fathom, and for the last 4 fathoms has been worth the latter amount—40*l.* per fathom. Under this incline rise we have a stope worth 20*l.* per fathom. It would be difficult to estimate the quantity of ore ground already discovered on both lodes over the deep adit, but I may truly say it is something enormous, whilst there is every prospect of our discovering still richer ground to the eastward, as in that direction the former workers obtained the greatest and richest bunches of ore worked in this mine. For the ore ground under the deep adit, in the 20 and 30 fm. levels, I beg to refer to my last report of Feb. 23, also for quantity of waste ore on surface. When that report was written I fully calculated that we should have had our machinery at work six weeks before we did so, but some little difficulties intervened, as they generally do in a work of this magnitude, which have now been completely removed, and we have now all our machinery at work, and which is not surpassed by any in the Principality. Lead ore is daily going into the ore house ready for sale, and we may expect our first sampling of 50 tons about this day month. I calculate we have 100 tons of ore or more broken, and one of the best mines ever opened in Cardiganshire.—ABSOLOM FRANCIS.

FULLY-PAID VENDORS' SHARES—IMPORTANT DECISION.

A decision of the greatest importance to purchasers of shares issued to vendors or others as fully paid-up was given by the Court of Appeal (the Master of the Rolls and Lord Justices James and Baggallay), on Wednesday, in the case of the winding-up of the Stapleford Collieries Company. The appeal which was from a decision of Vice-Chancellor Bacon raised a question of importance with regard to the effect of Sec. 25 of the Companies Act, 1867, which provides that "every share in any company shall be deemed and taken to have been issued and to be held subject to the payment of the whole amount thereof in cash, unless the same shall have been otherwise determined by a contract duly made in writing, and filed with the Registrar of Joint-Stock Companies, at or before the issue of such shares." The company was incorporated in January, 1871, and by an agreement dated May 10, 1871, they agreed to purchase the Staplefield Colliery from Richard Bridgman Barrow and William Hill for 5115*l.*, "to be paid or satisfied to the persons and in the manner hereinafter mentioned in that behalf." The 5115*l.* was to be paid or satisfied as to 2000*l.* to R. B. Barrow, and as to the residue to Hill. Of the 2000*l.* the company were to pay to R. B. Barrow 500*l.* in cash, and were to satisfy 1500*l.* (the residue of the 2000*l.*) to R. B. Barrow by issuing or transferring to him 300 shares of 5*l.* each in the company, issued and registered as fully paid-up. And, as to the 3115*l.*, the company were either to pay it in cash to Hill, or, at the option of either the company or Hill, were to issue or transfer to him 623 shares of 5*l.* each in the company, issued and registered as fully paid-up. R. B. Barrow was the chairman of the company, and his son, B. L. Barrow, was the solicitor of the company. B. L. Barrow sent the agreement to his London agent to be filed with the Registrar of Joint-Stock Companies, but owing to some oversight it was not registered. This omission was not discovered till April, 1872. It was supposed to be then too late to rectify the error, and consequently the agreement never was registered. The company elected to satisfy Hill's 3115*l.* by allotting to him fully paid-up shares, and on June 10, 1871, it was resolved to issue 300 fully paid-up shares to R. B. Barrow, and 623 fully paid-up shares to Hill. This was done, and those numbers of fully paid-up shares were registered in the names of R. B. Barrow and Hill respectively, and certificates were issued to them of fully paid-up shares accordingly. Hill sold 234 of his shares to B. L. Barrow, and he sold 100 of those shares to R. B. Barrow; R. B. Barrow also bought 120 of Hill's shares directly from him. Hill also sold another 100 of his shares to one Kimpton, who afterwards sold 80 of those 100 shares to R. B. Barrow. Hill also sold another 169 of his shares to one Cox, who afterwards sold 150 of those 169 shares to R. B. Barrow. Neither Kimpton nor Hill had any notice of the circumstances attending the original issue of the shares, or of the fact that they had not been paid for in cash, and the company issued to both Kimpton and Cox certificates which stated that the shares transferred to them and registered in their names respectively were fully paid-up. In this way R. B. Barrow became the registered holder of 750 shares described as fully paid-up—300 originally allotted to him, 100 bought from his son, 120 bought from Hill, 80 bought from Kimpton, and 150 bought from Cox. Of these 750, all but the first 300 were part of Hill's 623 shares. In January, 1876, the company was ordered to be wound-up. R. B. Barrow died soon afterwards, and B. L. Barrow was his executor. The liquidator claimed to put B. L. Barrow on the list of contributories for 134 shares in his own right, and for 750 as executor of his father, and the Vice-Chancellor ordered this to be done. Mr. B. L. Barrow appealed from the order, except so far as it related to the 300 shares originally allotted to his father. The only question of interest in the case was as to the 80 shares which the father had acquired from Kimpton, and the 150 shares which he had acquired from Cox (230 shares in all), both those persons as purchasers for value without notice being entitled, in accordance with the decision of the House of Lords in the case of "Burkinshaw *v.* Nicolls" (3 App. Cas., 1004), to hold the shares which they had thus acquired of fully paid-up, without any liability to make any further payment in respect of them. The question was whether this immunity operated for the benefit of a purchaser from them who had notice of the fact that the shares had not been paid for in cash. The Vice-Chancellor held that it did not.

Mr. WESTLAKE, Q.C., and Mr. NORTHMORE LAWRENCE were heard on behalf of the appellant.

Sir H. JACKSON, Q.C., and Mr. CRACKNALL, for the liquidator, contended that the principle of "Burkinshaw *v.* Nicolls" did not apply to a person who had notice that the shares had not been paid for in cash, even though he had acquired them from a person who had purchased them without any such notice, especially when the sub-purchaser was a director of the company, and thus filled a fiduciary position towards them.

The MASTER of the ROLLS said that as to all the shares except the 230 acquired by R. B. Barrow from Kimpton and Cox, they had clearly not been paid for in cash, and the Vice-Chancellor's order must be affirmed. But as to the 230 shares, the company, after they had issued to Kimpton and Cox certificates stating that their shares were fully paid-up (they having no notice that the shares had not been paid for in cash), could never have said as against Kimpton and Cox that their shares were not fully paid-up. As against the company, they were the absolute owners of fully paid-up shares, and they could sell the shares as fully paid-up to anyone whatever, whether he had or had not notice that the shares had not been paid for. The only exceptions from the ordinary rule that a purchaser for value without notice could transmit an equally good title to a purchaser with notice were when that purchaser had been guilty of fraud or breach of trust in relation to the property, in which case, of course, he would not be allowed to take advantage of his own wrong. But Mr. Barrow had done nothing wrong. There was nothing wrong in buying the shares. The appeal must, therefore, be allowed as to the 230 shares. But, as the appellant had claimed too much, no costs would be given in either Court. The liquidator would have his costs out of the estate. The order would be without prejudice to any claim which the appellant might make against the company for damages in respect of the other shares.

Lord Justice JAMES and Lord Justice BAGALLAY concurred.

AMERICAN IRON AND STEEL.

The following statement of the number and capacity of iron and steel manufactories of the country at the present time has just been prepared by Mr. J. M. Swank, Secretary of the American Iron and Steel Association:—

Number of completed blast furnaces, March 1, 1880	697
Number of blast furnaces building on March 1, 1880—23 bituminous, 12 anthracite, 9 charcoal: total	44
Annual capacity of completed furnaces, in pig-iron, net tons	6,500,000
Annual capacity of 206 bituminous furnaces, net tons	2,825,000
Annual capacity of 228 anthracite furnaces, net tons	2,600,000
Annual capacity of 66 charcoal furnaces, net tons	1,075,000
Number of completed rolling mills and steel works, Mar. 1	382
Number of rolling mills and steel works building, March 1.	10
Number of single puddling furnaces (a double furnace counting as two single ones)	4,467
Number of heating furnaces	2,419
Number of trains of rolls	1,397
Annual capacity of rolling mills in finished iron, net tons	4,000,000
Anuual capacity of rail mills, in heavy rails, net tons	2,150,000
Number of rolling mills having nail factories	73
Number of nail machines	4,152
Number of complete Bessemer steel works on March 1, 1880	11
Number of Bessemer steel works building on March 1, 1880	2
Number of Bessemer converters 22 completed; 10 building	32
Annual capacity in ingots, net tons—completed converters, 1,250,000; new converters, 500,000: total	1,750,000
Number of completed open-hearth steel works on March 1.	22
Number of open-hearth steel works building on March 1	3
Number of open-hearth furnaces—33 completed, 6 building	39
Annual capacity in ingots, net tons—completed furnaces, 225,000; new furnaces, 50,000: total	275,000
Number of completed crucible cast steel works on March 1	35
Number of crucible cast steel works building on March 1	3
Number of cast steel melting pots in the completed works.	3,080
Annual capacity in ingots, net tons	90,000
Number of miscellaneous steel works on March 1, 1880	9
Number of steel manupulating works on March 1, 1880	31
Number of completed forges (one building) on March 1, 1880 (make wrought iron from ore)	69
Annual capacity in blooms and billets, net tons	85,000
Number of completed bloomeries (one building) on March 1, 1880 (make blooms from pig iron)	60
Annual capacity in blooms, net tons	80,000

Philadelphia, April 15.

MINES AND MINING IN SIBERIA.

A correspondent of the Times who has recently visited Siberia has forwarded an interesting account of the exiles, their occupation and treatment. The most severe labour of these unfortunate people, he says, is that of the mines, of which there are three sorts—gold, silver, and coal. The silver mines are in the mountains in the neighbourhood of a town called Nertchinsk. It has been sometimes said that Siberian exiles are sent down and kept down in quicksilver mines, amid unhealthy fumes, till they die, not being allowed to come up to sleep, and he has been repeatedly asked since his return if this is not so. Having heard the statement before he went to Siberia, he put the question to several persons, both in the neighbourhood and elsewhere, whether such was not the case, and common fairness compels him to say that everyone denied it. Even the few Poles who spoke so bitterly of the Government did not bring this to their charge; nor did he meet any of the convicts who said as much. A young officer who visited these silver mines some years since told him among other things, that he believed they worked upon the "twelve-hour system," whereas the Director at Kara, who had charge of the gold-mines, said that he was not quite sure, but he was under the impression that they worked only eight hours. He heard it said that Government mines were not usually so well worked as private mines, and also that the greater part, if not all, the silver mines formerly belonging to the Government had passed into private hands. It may be that a certain number of convicts now work for these private companies, and in the silver mines of Siberia there must be unhealthy fumes, as in similar mines anywhere else; but he could not hear that those who worked them were submitted to any exceptional treatment, and everyone to whom he spoke upon the subject denied that the men were kept there continually. The coal mine is at Dui, in Saghalien. He heard more forbidding accounts of this place than of any other; but it was not with regard to the work. They work 12 hours a day in getting the coal from the mine and shipping it. The mine is in the hands of a private company, who may use the labour of 400 convicts, for which they pay. One officer who had often been there went so far as to say to him that the amount of work allotted to each man per day ought to be got through by an energetic workman in a couple of hours. For the truth of this he cannot answer. He will only add that those who had most to say in disfavour of Dui never complained that the prisoners were overworked, and everyone whose opinion he asked upon the subject gave a similar verdict. The gold mines he saw, and he went among the convicts at their work. Their labour consists of first removing the soil, stones, &c., which lie above the layers of sand containing gold, after which this sand has to be carried away by horses or men and emptied in a revolving cylinder pierced with holes. The sand and gold fall through the holes, while the stones are tumbled out at the end of the cylinder and have to be carted away. The number of men in the particular mine he visited was 120, together with 70 horses, and the quantity of earth they had washed during the day was 30 English cubic feet. They had to work from 6 in the morning, in summer, till 7 at night with respite for meals. Surrounding them was a cordon of military sentinels, and when the whistle sounded to cease work the numbers were called and the convicts marched off for the night, looking sad enough, but certainly not working so hard as free labourers; for when the convicts ceased work for the night the free labourers employed kept on, and in a private gold mine he visited near Krasnoiarsk the men worked from, he thinks, 4 in the morning, to 8 at night, doing so 7 days a week. The charge is sometimes made that the prisoners have no holidays, and have to work on Sundays. The former part is false; the latter part of the charge, he is sorry to say, is true. Those who defend it in the gold mines might, perhaps, reply that the exiles have no work to do in the winter, the ground being frozen; that the season for getting the gold is short; that it is not the custom to rest on Sundays in private Siberian gold mines; that the convicts work comparatively short hours; that they rest two days a month when they go to the bath; and observe as holidays certain church festivals and the birthdays of the Royal family. All which may be true, but in this instance he confesses he thought the convicts unjustly treated. It is much to be wished that the giving back to the convicts of the Sabbath may be among the long looked for reforms, and add another to the many ameliorations granted by the present emperor to his criminal subjects. In former days it was customary to chain the convicts to their tools or barrows; but, though he heard of one or two ferocious characters at Dui, there were none at Kara in that condition.

THE REGULATION OF PRODUCTION.—The object of the pamphlet of Mr. R. S. Moffat is to show that what he very properly calls the Orthodox School of Economy entertains erroneous views generally. In his attempt to attain this he has collected a large amount of information, and evidently read many of the recognised authorities, but he seems to take questions of political economy from an entirely new standpoint. Most writers on the subject assume that the object of the science is to teach us to do what at a given moment is best calculated to be most beneficial to the community generally, which in the case of commerce means that we must accept competition and change of circumstances as inevitable, and use principles which are acknowledged to be sound in dealing with them. Mr. Moffat, on the other hand, may be said to treat political economy historically, and to teach what might have happened under other treatment, supposing the result of that really followed could have been foretold with absolute certainty. There can, however, be no doubt that Mr. Moffat is correct in arguing that trades unionism is useful to the working classes so long as the employers do not adopt the same system.

FOREIGN MINING AND METALLURGY.

The condition of the French iron trade has remained nearly the same. Speculators have in some instances named lower rates for the iron and pig which they have in warehouse; on the other hand, the works well provided with orders, the execution of which will occupy them for some time, show no disposition to consent to a reduction in prices. Next month a good many contracts will run out, and we shall then see what turn the markets take in France. Merchants' iron is still quoted in France at 9*l.* 16s. per ton, and No. 2 plates at 11*l.* 4s. per ton; these are the rates named by producers. M. Prosper Henry, of Charleville, in the Ardennes, has just published for France and Belgium the Brundage patent for the mechanical manufacture of railway cramps, rivets, bolts, &c.

The Austrian iron trade has experienced no appreciable change so far as quotations are concerned, but still the tendency of prices is downwards. Complaints continue to be made with reference to the state of business, there being very little demand for iron and pig. Plates alone are in demand, as the proprietors of sugar works and breweries are profiting from low prices in order to repair their boilers.

Prices have been tolerably steady in the Belgian iron trade, and the markets have presented a rather more encouraging tone. Business has also been done rather more freely. The basis price for iron in Belgium appears to be 6*l.* per ton; pig for refining is pretty well maintained, but with iron at 6*l.* per ton business cannot be done in pig above 56s. or 64s. per ton at the most. It is difficult to give the price of casting pig; No. 5 is priced at 3*l.* 12s. per ton, with the usual scale of 2s. per ton per number. These rates are, however, to a great extent nominal. Nothing is known at present with reference to an adjudication of rolling stock for the Belgian State Railways; it is expected, however, that the number of wagons contracted for will have to be reduced, as the credit of 284,000*l.* which has been applied for will not cover the cost of the whole number originally named as necessary. M. Carbany, of Malines, has received an order for two trains of Belpaire carriages for the Upper Italy Railway. The same firm has also obtained a contract for locomotive wheels for the same system. We learn that the Montigny Rolling Mills (MM. Piérard Frères) have just contracted for the establishment of 18⅛ miles of metallic permanent way in Holland.

The Belgian coal trade has experienced no material change during the past week. Contracts have been renewed tolerably readily upon former terms. It is something that the decline in prices, which threatened to sweep everything before it, has been arrested. Belgian coal mining industry can scarcely be said, however, to be in a prosperous condition. In the Liége basin stocks are accumulating, and even those companies which have not any stocks on hand have not been enabled to dispose of their whole production. Working operations are generally carried on only five days per week, and wages have been reduced. The situation is nearly the same in the Borenage; five days' work per week is becoming general in that district also. In Austria colliery properters have maintained their March rates for coal, but merchants have not yet completed their supplies; the demand for coal has been rather feeble in Austria. Upon the German coal markets prices have been pretty well supported; the more important collieries have not made any change in their tariffs, and only the smaller coalowners have consented to any concession in regard to prices. The production of coal in the Dortmund district in the first quarter of this year is returned at 5,720,000 tons, as compared with 5,018,000 tons in the corresponding period of 1879.

GAS AND WATER COMPANIES' DIRECTORY.—The fourth annual edition—that for 1880—of Mr. Charles W. Hastings' useful little directory bearing this title has just been issued, and gives evidence of satisfactory progress having been made in filling up the tables of particulars. The directory shows the names of the town using the gas or water; the date of the Act, &c., under which the company exists; the amount of capital, the names of chairman, engineer, manager, and secretary; whether the works are carried on by a lessee, private owner, or by the corporation of the town, the population, the distance from London, and the railway upon which the town is situated. There is also an alphabetical index, so that the name of the officer being known his position and address can be instantly ascertained. The directory will be invaluable to all interested in the companies treated of.

TRAMWAY STATISTICS.—Tramway shares have now become so popular as an investment that there are a large number of capitalists constantly requiring to ascertain to whom the management of the several lines is entrusted, and the movement of the traffic returns—whether the receipts per week are increasiug or diminishing—and to supply this information Mr. W. W. Duncan, of St. Stephen's Chambers, has for the last four years compiled an interesting and useful series of statistics, the new edition of which—that for 1880—has just been issued, as the Manual of British and Foreign Tramway Companies. He states that his endeavour has been to supply us much information as possible in a condensed form, and so to make it an easy, reliable, and useful book, and that this endeavour has succeeded there can be no doubt. The mode which he has adopted in the analysis of accounts enables shareholders to compare the working of the companies in which they are individually interested with that of others, and so satisfy themselves as to the intelligence with which their property is managed. But valuable as are the figures and accounts, which, it is gratifying to say, show in almost every instance a very satisfactory increase as compared with the preceding half-year, the expense of preparing this portion of the book must have been small in comparison with the cost of the maps which accompany the details referring to each town or city. These are well executed in chromo-lithography by Stanford, of Charing Cross, and show the tramway routes on a general plan of the town, so that the volume, which is published at the author's office, would probably be as useful to the general public as to the investor. The tables are filled to date for the current year, and blanks are provided for continuing the traffic returns and differences for the principal lines, so that a more nearly perfect book of reference and record could not be desired; it is in every respect deserving of extensive patronage.

COPPER ORES.

Sampled April 28, and sold at Swansea, May 11.

Mines.	Tons.	Produce.	Price.	Mines.	Tons.	Produce	Price.
Betts Cove	143	6⅜	£3 14 0	Virneberg	31	10¼	£ 6 14 0
ditto	142	6⅜	3 14 6	Vigsuaes	65	21	11 10 0
ditto	74	6⅛	3 14 6	ditto	65	20½	11 1 0
ditto	4	6½	4 0 0	ditto	65	20	10 17 0
Virneberg	33	22½	13 18 6	ditto	64	20½	10 17 6
ditto	78	12	7 8 6	La que lo Abarca	99	22½	13 10 6
ditto	77	12	7 9 0		29	14½	9 3 6
ditto	26	14	8 4 6	Cambrian	21	17	10 12 6
ditto	30	15⅝	9 10 6	ditto	19	16	9 19 6
ditto	12	15¾	9 10 6	ditto	12	7¾	4 17 6

TOTAL PRODUCE.

Betts Cove	363	£1349	14 0	La que lo Abarca	128	£1605	1 0
Virneberg	227	2433	18 6	Cambrian	52	471	3 0
Vigsuaes	259	2267	0 0				

COMPANIES BY WHOM THE ORES WERE PURCHASED.

Names.	Tons.	Amount.
Copper Miners' Company	400	£ 2,112 14 6
Nevill, Druce, and Co.	166	1,635 15 6
Williams, Foster, and Co.	183	2,112 0 6
Mason and Elkington	129	1,401 5 0
Charles Lambert	65	718 5 0
Landore Copper Company	126	746 16 0
Total	1069	£ 8,726 16 6

NO SALE on May 25.

TOTALS AND AVERAGES.

	21 cwts.	Produce.	Price.	Per unit.	Standard
Whole sale	1069	13¾	£3 0 3	11s. 8¾d.	£80 19 6

Lectures on Practical Mining in Germany.

CLAUSTHAL MINING SCHOOL NOTES*—No. CXLXII.

BY J. CLARK JEFFERSON, A.R.S.M., WH. SC.,
Mining Engineer, Wakefield.
(Formerly Student at the Royal Bergakademie, Clausthal.)
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SULPHURETTED HYDROGEN is formed spontaneously under a variety of circumstances. It is produced during blasting, by the putrefaction of animal matters, such as allumen or the white of eggs, which contains sulphur; chiefly from the decomposition (not oxidation) of pyrites, which may be converted into sulphates by the oxygen dissolved in water, and from which by contact with decaying organic matter, rotting props, &c., sulphuretted hydrogen is formed and given off. Whenever a soluble sulphate remains in contact with decaying animal or vegetable matter the sulphate looses hydrogen, which combines with the elements of the decaying substance, whilst the soluble sulphide of the metal remains. A portion of the nascent sulphur probably seizes the hydrogen of the decaying matter. Such soluble sulphides are readily decomposed, even by carbonic acid, with the expulsion of sulphuretted hydrogen, which remains partly dissolved in the water to the extent of about three volumes of gas at the ordinary mine temperature. This gas is readily disengaged from the water by agitation.

The specific gravity of sulphuretted hydrogen is 1·18, and therefore but slightly heavier than air. It emits a very disagreeable odour, most resembling that of rotten eggs. It is generally considered by miners as the most poisonous of gases met with underground, and is that which is generally understood under the name of "white damp." It is highly poisonous when breathed in a concentrated form, though M. P. Duchatelet states that workmen can breathe in an atmosphere containing 1 per cent. of this gas with impunity, and that he has inspired air containing as much as 3 per cent. without experiencing any ill effects. It appears to act upon the blood, turning it to a brown-black colour, depriving it of the elements necessary for respiration. According to Faraday air containing 1-1500th of this volume is fatal to birds, 1-800th to dogs, and according to Coombes 1-250th to horses. It seems probable that a very small proportion of this gas in air will in time seriously affect the health of anyone continuously breathing such an atmosphere.

Sulphuretted hydrogen burns with a pale bluish flame, and explodes when mixed with air at a low red heat, the products of combustion being sulphurous acid and water. An explosion which occurred at the Sandberger Copper Mine, near Neusohl, whilst driving a rise into old workings, was probably owing to the ignition of sulphuretted hydrogen.

According to experiments, moistened pyrites, from the coal of the Tyne district gives off considerable quantities of sulphuretted hydrogen at ordinary atmospheric temperatures. This, however, is due first to the formation of sulphates. It is most likely to be met with in old workings containing water, in which it may be dissolved and under considerable pressure, so that on tapping off the water it would be set free in a mechanical manner. Consequently care is required in opening a communication with the old workings to prevent the water suddenly penetrating into new workings and surcharging them with sulphuretted hydrogen. In consequence of a neglect of this precaution a fatal accident occurred at the coal mines Sieper and Muhlen, near Sprockhovel, and Maria Anna and Steinbeck, near Bochum.

SULPHUROUS ACID has been detected in the air of th mines in Cornwall and other places, and is probably due in most cases to blasting; and in mines where fire setting is employed, to the roasting of any sulphuretted ores in the immediate neighbourhood of the fire. This gas has a pungent suffocating odour, and induces head ache. As it is usual to have a ventilating current to cary away the powder smoke, the miner is very seldom troubled with it for any great length of time, and its influence on the health of the miner is very unimportant.

AMMONIA is generally met with in the underground stables of mines, and is due to the decomposition of animal excrement. Its injurious influence is chiefly an irritation of the lungs.

MERCURY and ARSENIC vapours are met with more or less in quicksilver and arsenic mines; the former, however, are perhaps the only underground emanations which a good current of air will not render inoxious.

ON INSTRUMENTS USED IN CONNECTION WITH THE VENTILATION OF MINES.

These may be divided into two broad classes, those used for ascertaining the condition of the air, and those used for measuring the velocity of the ventilating currents.

1.—Instruments used for ascertaining the condition of the air may be divided into the following three classes, which we shall consider in the order named. Indicators for ascertaining the presence and the amount of foreign gases, and instruments for ascertaining the pressure and the temperature of the air.

Ansell's indicator depends on the phenomenon of diffusion for its action, and in particular on the fact that when the mouth of a vessel containing air is closed by a porous diaphragm, and introduced into an atmosphere containing a proportion of marsh gas, this latter diffuses into the vessel much more rapidly than the air diffuses out. Ansell's indicator consists of a bowl-shaped metallic vessel, the lower end of which communicates with a **U** shaped tube. The free end of this tube is connected by means of a brass fitting with a short glass tube. The glass tube isolates a brass cap, which is fixed to its upper end, from any metallic connection with the rest of the apparatus. The brass cap is provided with a binding screw for connecting it with a wire from a galvanic battery. From the lower end of the brass cap a short copper wire (the end of which is tipped with platinum) dips partly into the glass tube. Quicksilver is now poured into the metallic vessel, until the mercury rises in the glass tube to within a short distance of the platenised wire, The metallic vessel has a binding screw attached to it, so that it can be connected by means of a wire to the opposite pole of the galvanic battery. The top of the vessel is now covered by a tightly fiiting porous diaphram, formed of Wedgewood ware, which is cemented air tight round the edges. The apparatus is fixed in that portion of the mine where danger from an outburst of gas may be expected. Should an outburst take place, and surround the indicator with gas, diffusion at once commences; the gas diffuses faster through the diaphram into the vessel than the air out, and consequently raises the quicksilver in the glass tube, and immediately it is raised so high as to come into contact with the platinised wire the circuit is completed. An electric alarum is inserted in the circuit, and directly the circuit is closed the alarum begins to sound, indicating that the instrument is surrounded by gas By lowering the platernised wire to a very short distance from the surface of the quicksilver the apparatus may be made so sensitive that the alarm is sounded within two or three seconds after the outburst of the gas.

The instrument just described is intended to be usen as a warning in case of sudden outbursts. In places where only a gradual accumulation of gas may be expected Ansell makes use of marble of various thicknesses as a diaphram. By using marble plates one quarter inch thick the presence of gas which has been accumulating for half an hour to form an explosive mixture is indicated as soon as it becomes explosive. With marble diaphrams ½ inch thick the presence of gas which has required two hours to accumulate, so as to form an explosive mixture, is indicated within that time.

In order to ascertain the presence of carbonic acid the apparatus must be somewhat differently arranged, since in this case air diffuses more rapidly out through the porous diaphram than carbonic acid diffuses inwards. The metallic bowl-shaped vessel is covered, as before described, with a porous diaphram. The bottom of the vessel is attached by means of a brass fitting to a glass tube, which serves as a stem for the bowl-shaped vessel. A short copper wire, tipped with platinum, is fixed to the brass fitting, and dips down into the hollow glass tube. The bowl-shaped vessel can be connected, as before described, with a wire from the galvanic battery, by means of a binding screw. The top of the bowl-shaped vessel is covered, as before, by a porous diaphragm. The lower end of the glass tube terminates in a brass fitting, to which a wire from the opposite pole of the galvanic battery is attached. The brass fitting fixes the glass tube to a hollow stand, and is connected with a leather bag, which contains quicksilver. By means of a cork, which is pressed against the leather bag, the latter can be flattened and made of less capacity, causing the quicksilver to rise through the brass fitting, and in the glass tube, to any desired nearness to the platinised wire. Should the instrument become surrounded by carbonic acid, the air contained in the bowl-shaped vessel diffuses out through the porous diaphram more rapidly than the carbonic acid diffuses into the vessel, and hence a partial vacuum is produced; the mercury rises in the glass tube, and immediately its surface comes in contact with the platinised wire the circuit is closed, and an alarum placed in the circuit immediately gives warning.

A very simple instrument has been invented by Dr. Von der Weyde, which not only indicates the presence of foreign gases, but from which the nature of the gases can be very accurately conjectured. This apparatus consists of an ordinary porous cell, such as is used for galvanic batteries, the upper end of which is closed by a porous plate, with a hole in the centre, in which a cork can be inserted. One end of a **N** shaped tube is inserted in the cork. Before inserting the tube in the cork a quantity of coloured water, or quicksilver, is poured into the free end of the tube, till a fluid rises in the two outer bends, or rather vertical stems, to half their height. The joints between the cork and porous lid and glass tube, and between the porous lid and the cell, are made air-tight, by sealing them up with red wax. When the apparatus is introduced into a gas, or atmosphere containing a gas, whose rate of diffusion is greater than that of air such as marsh gas the gas diffuses into the porous cell more rapidly than the air out of it. The pressure inside the porous cell becomes greater than the atmospheric pressure, and raises the fluid in the last outer vertical bend of the glass tube. When, however, the apparatus is introduced into a gas or atmosphere containing a gas such as carbonic acid, whose rate of diffusion is less than that of air, then the air in the porous vessel diffuses out more rapidly than the gas inwards, and hence a partial vaccum formed, or rather the pressure is lowered inside the porous cell, and the coloured water sinks in the outer vertical bend of the glass tube. In this manner not only is the presence but also the nature of the gases contained in the atmosphere readily ascertained.

It will be readily understood that where workings are likely to be rapidly though gradually filled with an explosive atmosphere, and especially where ordinary Davy lamps are used, the gas may come down and begin firing in the lamp, and continue to do so without being noticed by the miner if the latter is hard at work. If this be continued for three or four minutes the gauze may become red hot and pass an explosion through it to the surrounding explosive mixture of air and gas before being noticed by the miner, and there is little doubt but that when and where Davy lamps have been exclusively used some of the explosions which have occurred may be due to the miner not noticing the firing of the gas in his lamp placed at some distance from and behind him. To remedy this a Frenchman of the name of Turquan has designed an alarum in connection with a safety lamp. The alarum, which is contained in the stand of the lamp, consists of a spring, gong, and hammer, escapement-wheel, and locking arm. The latter is drawn tight by a piece of thread or twine, which has been previously dipped in a solution of saltpetre to render it more inflammable, the opposite end being made fast to some portion of the lamp inside the gauze. When the surrounding atmosphere has reached the explosive point the first firing of the gas inside the gauze sets fire to the piece of twine, which burns in two, releasing the locking arm and escapemen wheel, and the alarum sounds a warning to the miners to put out their lights and withdraw.

* Being Notes on a Course of Lectures on Mining, delivered by Herr Bergrath Dr. VON GRODDECK, Director of the Royal Bergakademie, Clausthal, The Harz North Germany.

FOREIGN MINES.

ALAMILLOS.—April 28: In the 20, driving west of San Felipe's shaft, the men are put to drive a cross-cut north. A great length was driven through in the past month in the 115, west of Taylor's engine-shaft, and the lode is still large and open; producing 1½ ton per fathom. In the 100, driving west of Taylor's engine-shaft, there is a very good stone of ore in the bottom of the level. The 85, driving west of San Adriano's shaft, is quite unproductive at present. The lode in the 60, driving east of San Victor's shaft, is of a very promising appearance indeed; producing 1 ton of ore per fathom. The 70, driving east of San Victor's shaft, will be holed to Cristobal's winze in the coming month, east of which we expect a good lode. In the 70, driving west of Judd's engine-shaft, nothing of value has as yet been met with by this cross-cut. In Taylor's engine-shaft, sinking below the 115, the ground is hard, and the men were hindered several days in the past month. San Jose shaft, sinking below the 30, will be completed to the 40 in the present month. Alfonso's winze, sinking below the 60 fm. level, is down to the 70. The 115 having drained Alberto's winze below the 100, and worth ¾ ton per fathom, the sinking is resumed, and we expect to get through this month. The lode in Canton's winze, sinking below the 50, has greatly improved, and produces 4 tons per fathom. Cristobel's winze, sinking below the 100, and valued at 1 ton per fathom, is, in fact, the 70 fm. level, driving west of said winze, to meet the same level, east of San Victor's shaft. The usual rate of returns was kept up very steadily during the past month, and the stopes are now without any change of importance. The works at surface are going on regularly, and the machinery is in good working order. We estimate the raisings for May at 175 tons.

FORTUNA.—April 27: The lode in the 120, driving west of O'Shea's engine-shaft, is small and poor. In the 50, driving west of Abercrombie's shaft, the ground is hard and the lode small. The lode in the 60, driving in the same direction, has a very promising appearance, and is worth ¾ ton per fathom. In the 70, driving west of San Pedro shaft, there is a compact lode containing quartz and lead ore, producing ½ ton per fathom. The 80, driving west of San Pedro shaft, consists of a strong open lode, valued at ¾ ton per fathom. The lode in the 80, driving east of San Pedro shaft, maintains its size and value, being worth 1 ton per fathom. In the 70, driving east of San Pedro shaft, the lode does not improve. The lode in the 120, driving east of O'Shea's engine-shaft, has improved within the last few days, its present production being 1 ton per fathom. In the 110, driving east of Lownde's engine-shaft, there is a large lode opening up good stoping ground, worth 1 ton per fathom. In the 90, driving east of Carro's shaft, there is no lead to value. Fair progress is being made in San Pedro engine-shaft, sinking below the 80. The lode in Arista's winze, sinking below the 30, is large, and contains good stones of lead ore, worth ¾ ton per fathom. The new winze Rosa, sinking below the 70, is situated in advance of the 80 end, east of San Pedro shaft, and produces ¾ ton per fathom.—Los Salidos: The lode in the 175, driving west of Taylor's engine-shaft, and valued at 1½ ton per fathom, continues good. In the 160, driving west of Taylor's engine shaft, the lode is small but regular, producing ¾ ton per fathom. The lode in the 175, driving east of Taylor's engine-shaft, worth ½ ton per fathom, has not been so good during the last few days. The 160, driving east of Taylor's engine-shaft, consists of a strong lode, composed of quartz and spots of lead ore. The lode in the 145, driving east of Taylor's engine-shaft, is compact, producing a little ore, but not enough to value. In the 130, driving east of Taylor's engine-shaft, the main part of the lode has again been cut, and it is moderately productive at ½ ton per fathom. The 120, driving west of San Pablo shaft, maintains its usual productiveness at 3 tons per fathom. The lode in the 110, driving east of San Miguel shaft, is small and poor. The 80, driving west of Palgrave's engine-shaft, is still poor, and ground hard. The lode in the same level, driving east of Palgrave's engine-shaft, is not yet intersected; favourable for driving. Roberto's winze, sinking below the 145, and producing 1½ ton per fathom, is communicated to the 160. The lode in Loam's winze, sinking below the 120, is strong, and of a promising appearance; worth 1½ ton per fathom.

BUENA VENTURA.—April 28: The lode in the 25, driving west of No. 2 shaft, is becoming more settled and hard, with a good branch of ore. In the 40, driving east of Cox's engine-shaft, the lode is very easy for driving, and yields good stones of ore. The lode in Cox's engine-shaft, sinking below the 40, has very much improved, being worth 1 ton per fathom, and is, in the western end of the sink, very productive, but it diminishes in value towards the other extremity of the shaft. We have resumed the sinking of No. 2 winze below the 10, and hope to get it through to the 25 in the ensuing month. The works at surface are going on very satisfactorily, and the engine and boiler houses on Taylor's shaft well nigh completed. The stopes in the eastern mine yielded fairly well in the past month, but are not quite so productive at present. We have several bargains set to tributers, who will soon begin to deliver in parcels of ore.

LINARES.—April 28: The lode in the 115, driving east of Warne's engine-shaft, is large, with good stones of ore. In the 135, driving west of Peill's engine-shaft, the lode is worth ½ ton per fathom, but is not so productive as it was. A great length of valuable lode is being laid open in the 120, driving in the same direction, valued at 2 tons per fathom. The 105, driving west of Peill's engine-shaft, and producing 2 tons of lead ore per fathom, continues to turn out well. The 135, driving east of Peill's engine-shaft, is very poor at present, and at the same time hard and expensive for driving. The lode in the 120, driving east of Peill's engine-shaft, and worth ½ ton per fathom, is rather small. In the 105, driving east of San Francisco shaft, the lode is compact and regular, and of a promising appearance, producing 1½ ton per fathom. The men are getting on well with Warne's engine-shaft, sinking below the 115, which is worth 2 tons per fathom. The vertical line of the shaft will leave the lode on the north side. The lode in No. 232 winze, sinking below the 105, and valued at 1 ton per fm., continues rather small. The water has so increased as to prevent the sinking of No. 334 winze below the 120 for the present; it is worth 4 tons per fathom. The lode in No. 235 winze, sinking below the 100, is open and easy for sinking, with good stones of ore, valued at 1 ton per fathom. The returns were kept up without difficulty during the past month, and the stopes are turning out well at present. The surface work is going on very regularly, and the machinery is in good condition. We estimate the raisings for May five weeks at 300 tons.—Quinientos Mine: The 100, driving east of Taylor's engine-shaft, consists of a strong lode, with occasional stones of ore. The lode in the 90, driving east of Taylor's engine-shaft, is very large, and of a promising appearance. In the 80, driving east of boundary shaft, the lode is small, compact, and regular, producing ⅛ ton per fathom. The lode in the 50, driving east of boundary shaft, and worth ½ ton of ore per fathom, is small, and the granite very hard for driving through. The men are getting on well with Judd's engine-shaft, sinking below the 60. We estimate the returns for May at 75 tons.

PONTGIBAUD.—May 1: Roure: The 200 metre level, south of Taylor's shaft, continues in hard ground, composed of quartz spotted with ore. The same level north is favourable for driving; the lode is composed of jointy unproductive quartz. The 175 metre level south has entered soft decomposed rock; the lode is poor. The same level north continues in a regular well defined lode, composed chiefly of blue quartz, spotted with ore. The winzce in the bottom of this level is unproductive. The lode in the 150 metre level north is improved in appearance; it yields good stones of orestuff in the back of the level. The winze below this level just over the 175 end yields a little saving work. In the 150 metre level south we have set to cross-cut east to intersect the main part of the lode lying in that direction. The 100 metre level, south of cross-cut, on the middle vein, is poor. The same level south, on Virginie's lode, yields ½ ton of ore per current metre. The 80 cross-cut east is without change—rock hard. The rise in the 40 metre level south, on the main lode, yields a little low-quality saving work. The 40, south of cross-cut, on the eastern part of the lode, yields ⅓ ton of ore per current metre. The same level north is unproductive. The 20 rise, on the caunter lode, yields stones of ore. The adit north, on the same lode, yields ¼ ton of ore per current metre. At Mioche the tribute pitches are a little diminished in value.—La Brousse: The sinking of Alice's engine-shaft goes on regularly; we shall attain the necessary depth for cutting the 160 plat in the present month. The 140 metre level south yields a little ore. The 120 metre level north yields ⅓ ton of ore per current metre. The 100 metre level north is being driven parallel to the old level on the under part ot the lode, which yields stones of ore irregularly. The 80 metre level south has entered disordered ground; the lode is poor.—Pranal: The 110 metre level, south of St. George's shaft, yields stones of silver-lead ore and blende. The rise in the back of the same level north is poor. The 90 metre level north yields ⅓ ton of ore per current metre. The same level south, on the eastern part, yields ¼ ton of ore per current metre. The 90 south, on the main part of the lode, is unproductive. The lode in the 70 metre level north is getting more settled. The winze behind this end is holed to the 90, opening a good piece of ore ground: worth from ½ to ¾ ton of ore per current metre. The winze in the 70 metre level south yields a little orestuff. The 50 metre level north yields ¼ ton ot ore per current metre. The 50 cross-cut east is in hard ground. We have set to drive north of this point, on the lode intersected some months since, where it presents a strong and regular appearance, yielding stones of blende, and spotted with ore.—Surface: Our dressing has gone on regularly, and the samplings have amounted to 230 tons.—New Trial Works: At Lavergne we have set to sink a winze in the bottom of adit level, but find the water to be very strong; the lode has yielded stones of orey stuff of kindly appearance. At Teisonniere the sinking of the surface shaft has gone on pretty well until the late rains, since when there is a great increase of surface water, which we hope to take off by making a trench, when the sinking will be carried on with a full force. At Villelongue the sinking of the shaft goes on rather slowly, the ground being hard and rather wet, and letting out a little carbonic acid gas, obliging us to fix a fan for ventilation.

PESTARENA UNITED.—May 3: Pestarena District: Peschiera: The end in fthe No. 1 lode in the 110 fm. level, driving north, produces 4½ tons of ore per sathom; and yields 1 oz. of gold per ton; the lode is 1 ft. wide, in congenial tchist. The end driving south produces 3½ tons per fathom, yields 1 oz. per on, and is passing through stiff micaceous rock, with patches of quartz intermixed. The 55 end driving north has a small unproductive lode, in stiff ground. The 33 end driving north is in decomposed schist, spotted with pyrites.—Acquivita: The 33 end driving north produces 8 tons per fathom, yields 7 dwts. per ton, and has a good-sized lode of quartz, thickly spotted with pyrites.—No. 5 Lode: In the 65 the lode in the end driving north is small, and not yielding ore to value. The end driving south produces 8 tons per fathom, yields 11 dwts. per ton, and has a lode 1½ ft. wide, stiff quartz, with patches of pyrites. The 33 end driving north produces 2 tons per fathom, yields 2½ dwts. per ton, and is in decomposed schist, spotted with pyrites. In the 90 a cross-cut west has just been commenced to develope No. 5 and other lodes at a deeper point than is yet seen. Regular working has been disturbed during the past month by the breaking down of the Peschiera tribune, but the water is now cleared again, and driving at the bottom levels resumed. Air is being carried down to the 33 to force the driving on the No. 5 lode, that early communication may be made to the 65 for ventilation on this lode to the lowest point. There has been a little improvement in the quality of the ore during the past week. Ground excavating for the new mills is now being proceeded with systematically. We have been very short of miners during the past month, but batches are now being procured from a new district, and it is hoped there will be no more defficiency.

Val Toppa District: The end south on Marmo Rosso, at Intermediate under Zero, produces 8 tons per fathom, yields 6 dwts. per ton, and has contorted quartz spreading all over the front. The end south on west lode, at No. 1 level, produces 4 tons per fathom, and yields 6 dwts. per ton; the rock has changed to thin laminated quartzite, with faces of pyrites. The quartz in end south on great quartz lode, at No. 2 level, is now appearing to form a regular branch that will give ore. The end south on flat lode, at No. 2 level, now shows strings of ore, producing saving work. The end south on middle branch, at No. 2 level, is suspended. The end south on middle lode, intermediate under No. 2, produces 6 tons per fathom, yields 7 dwts. per ton, and has thin laminated quartzite impregnated with pyrites. The cross-cut east at No. 3 level is in massive schist, letting out a good deal of water. The end south on middle lode, at No. 3 level, has been resumed, and has a promising appearance; it produces 4 tons per fathom, and yields 5 dwts. per ton. In the end south on great quartz lode, at No. 5 level, two branches of quartz with fine pyrites are commencing to make, and promise improvement. At the beginning of the month the general tenor of the ore was low, but it has improved lately. The machinery continues to work well.—The return of gold for April is as follows:—Val Toppa: 224 ozs. 12 dwts. 10 grs., from metric tons 658·322; average yield per ton, 6 dwts. 19¾ grs.—Pesterena: 327 ozs. 18 dwts. 15 grs., from metric tons 359·550; average yield per ton, 17 dwts. 23 grs. Total from the two districts: 552 ozs. 11 dwts. 1 gr., from metric tons 1017·872; average yield per ton, 10 dwts. 20½ grs.

[For remainder of Foreign Mines see to-day's Journal.]

Messrs. RICKARDS and BUDD (May 10).—Copper: The tendency all through the past month has been downwards, and the price of Chili bars now is nearly 10*l.* lower than on April 1. There has been some fluctuation in the market, and a good quantity of bars have changed hands. The deliveries out of stock are good, but the actual stocks and visible supplies are very large, and the demand for manufactured copper continues slack.

EXPORTS—First four months.	1878.	1879.	1880.
English copper—wrought and unwrght...Tons	10,798	9,874	9,604
Foreign copper—unwrought	4,435	4,460	5,434
Yellow metal	5,347	5,488	5,068
Total	20,580	19,822	20,106
IMPORTS—First four months.			
Copper in ores	3,138	3,078	3,996
Copper regulus and precipitate	6,697	8,636	9,955
Bars, cake, and ingots	13,833	16,544	14,861
In pyrites, estimated	5,080	4,322	6,098
Total	28,748	32,580	34,910
Total stocks in Europe and afloat, May 1 adding fine copper in ore and precipitate at Liverpool, not previously included	47,031	54,652	62,664

Total deliveries of Chili and other copper out of public stocks—Swansea, Liverpool, London, and Havre—in Feb., 6700 tons; March, 3200 tons; April, 5600 tons.

TIN.—The statistical position continues to improve, and the figures now look better than for some years past. A brisk demand for tin-plates has set in, and there is every appearance of stocks continuing to decrease. The delivery of foreign out of warehouse, London and Holland, is—Jan. 1 to April 30, 1880, 6725 tons, against 6725 tons in 1579, and 6280 tons in 1878. The stock of tin in public stocks here and in Holland, omitting Banca in Dutch Trading Company's hands, is—April 30, 1880, 11,100 tons; April 30, 1879, 14,700 tons; April 30, 1878, 12,700 tons.

	1880.	1879.
Shipments of Straits to England, Jan. 1 to April 30...Tons	90	1,925
" Australian	1,885	2,815
Total	1,975	4,740

The quantity of tin exported from the United Kingdom, Jan. 1 to April 30, as shown by the Board of Trade Returns, was—

	1880.	1879.	1878.
English ...Tons	1,544	....against 1,690	....against 1,894
Foreign	3,566	1,880	2,175
Total	5,110	3,570	4,069

GOLD MINING IN NEW ZEALAND.—The Thames Advertiser (March 27) says:—"We have had unmistakeable evidence of a considerable revival in mining matters during the month. Not only have the claims near the summit of the Moanataiari Hill shown that good golden stone yet remains to be worked in a large area of ground, but the ground on the flat has likewise given indications of great improvement, and the adjustment of the pumping difficulty by the sale of the mines and plant has cleared the way for a new lease of life to mining properties and to the goldfield generally. As our readers are aware, the county authorities foreclosed certain mortgages over the beach claims, and by this means companies almost defunct, in consequence of the burden of indebtedness which hung over them, have taken fresh courage, and are about recommencing mining operations in earnest."

EPPS'S COCOA—GRATEFUL AND COMFORTING.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Epps has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame."—*Civil Service Gazette.*—Sold only in packets labelled—"JAMES EPPS and Co., Homœopathic Chemists, London."

PARIS EXHIBITION, 1878.

GOLD AND SILVER MEDALS AWARDED for Steam-Engines & Boilers, also the Special Steam Pump, and Compound Pumping Engine.

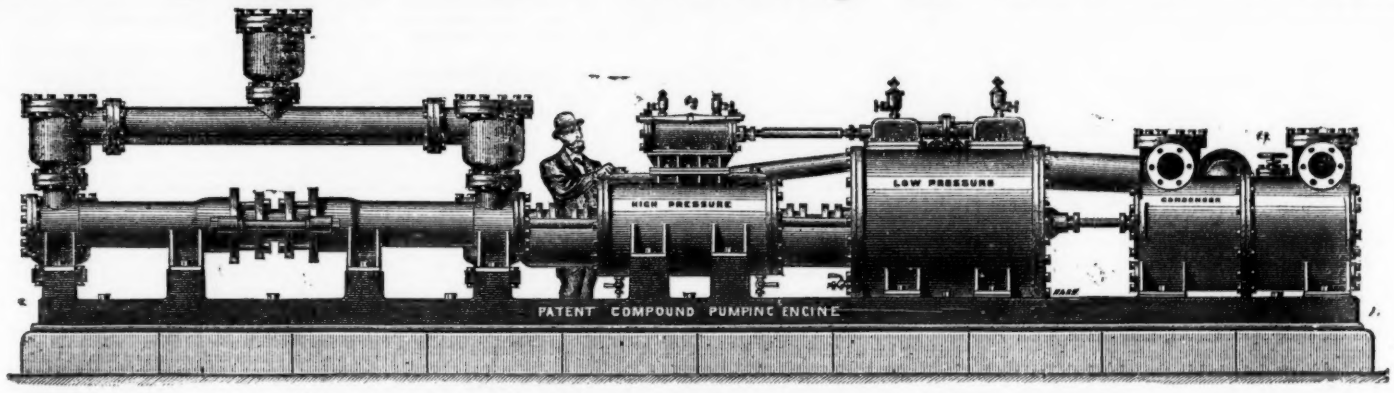
TANGYE BROTHERS AND HOLMAN,

CORNWALL HOUSE, 35, QUEEN VICTORIA STREET, LONDON, E.C.,
AND BIRMINGHAM, (TANGYE BROTHERS), CORNWALL WORKS, SOHO.

TANGYE'S DIRECT-ACTING
COMPOUND PUMPING ENGINE,

For use in Mines, Water Works, Sewage Works,

And all purposes where Economy of Fuel is essential.



TANGYE'S DIRECT-ACTING COMPOUND PUMPING ENGINE, WITH AIR-PUMP CONDENSER.

TANGYE'S COMPOUND PUMPING ENGINE COMBINES SIMPLICITY, CERTAINTY OF ACTION, GREAT ECONOMY IN WORKING, COMPACTNESS, AND MODERATE FIRST COST.

This Engine will be found the most simple and economical appliance for Mine Draining, Town Water Supply, and General Purposes of Pumping ever introduced, and as regards Mine Draining, the first cost is very moderate compared with the method of raising water from great depths by a series of 40 or 50 fm. lifts. No costly engine-houses or massive foundations, no repetition of plunger lifts, ponderous connecting rods, or complication of pitwork, are required, while they allow a clear shaft for hauling purposes. In this Engine the economical advantages resulting from the expansion and condensation of steam are very simply and effectively obtained. The steam after leaving the high-pressure cylinder is received into and expanded in the low-pressure cylinder, and is thus used twice over before being exhausted into the condenser or atmosphere.

The following first-class Testimonials will bear evidence as to the efficiency and economy of the Engine :—

TESTIMONIALS OF TANGYE'S COMPOUND PUMPING ENGINE.

$\frac{21"}{36}$ × 10" × 48" COMPOUND CONDENSING STEAM PUMPING ENGINE.

Newcastle and Gateshead Water Company, Newcastle-on-Tyne, Oct. 20, 1879.

Messrs. Tangye Brothers.

GENTLEMEN,—In reply to your enquiry as to the efficiency of the two pairs of Compound Condensing Engines recently erected by you for this company at our Gateshead Pumping Station, I have great pleasure in informing you that they have far surpassed my expectations, being capable of pumping 50 per cent. more water than the quantity contracted for; and by a series of experiments I find they work as economically as any other engine of the compound type, and will compare favourably with any other class of pumping engine. By the simplicity of their arrangement and superior workmanship they require very little attendance and repairs, and the pumps are quite noiseless. A short time ago I had them tried upon air by suddenly shutting off the column, and found they did not run away, thus showing the perfect controlling or governing power of the Floyd's Improved Steam-moved Reversing Vale. I will thank you to forward the other two pairs you have in hand for our Benwell Pumping Station. Yours respectfully,

(Signed) JOHN R. FORSTER, Engineer.

$\frac{21"}{36}$ × 12" × 48" DOUBLE RAM COMPOUND CONDENSING STEAM PUMPING ENGINES.

The Chesterfield and Boythorpe Colliery Company (Limited), Registered Office, Boythorpe, near Chesterfield, Oct. 1, 1879.

Messrs. Tangye Brothers. Supplied in January, 1878.

GENTLEMEN,—Referring to the above, which we have now had working continuously night and day for the last 12 months, we are glad to say that it is giving us every satisfaction. It is fixed about 400 feet below the surface, the steam being taken down to it at pressure of 45 lbs. per square inch. We can work the pump without any difficulty at 28 strokes per minute=224 ft. piston speed. The pumping power is enormous. The vacuum in the condenser being from 11½ to 13 lbs. The pump is easily started, and works well and regularly. The amount of steam taken being much less than we anticipated. We consider the economy in working very satisfactory indeed. The desire for power and economy at the present day will certainly bring this pump into great requisition. Yours truly,

(Signed) M. STRAW, Manager.

SIZES AND PARTICULARS.

Diameter of High-pressure Cylinder.....In.		8	8	8	10	10	10	10	12	12	12	12	14	14	14	14
Ditto of Low-pressure Cylinder .....In.		14	14	14	18	18	18	18	21	21	21	21	24	24	24	24
Ditto of Water Cylinder .....In.		4	5	6	5	6	7	8	6	7	8	10	7	8	10	12
Length of stroke .....In.		24	24	24	24	24	24	24	24	24	24	24	36	36	36	36
Gallons per hour approximate		3900	6100	8800	6100	8800	12,000	15,650	8,800	12,000	15,650	24,450	12,000	15,650	24,450	35,225
Height in feet water can be raised with 40 lbs. pressure per square inch in cylinder	Non-condensing...	360	330	160	360	250	184	140	360	264	202	130	360	275	175	122
Ditto ditto	ditto—with Holman's Condenser...	480	307	213	480	333	245	187	480	352	269	173	480	367	234	162
Ditto ditto	ditto—with Air-pump Condenser...	600	384	267	600	417	306	335	600	440	337	216	600	459	203	203

CONTINUED.

Diameter of High-pressure Cylinder .....In.		16	16	16	16	18	18	18	18	21	21	21	24	24	24	30	30
Ditto of Low-pressure Cylinder .....In.		28	28	28	28	32	32	32	32	36	36	36	42	42	42	52	52
Ditto of Water Cylinder .....In.		8	10	12	14	8	10	12	14	10	12	14	10	12	14	12	14
Length of stroke .....In.		36	36	36	36	48	48	48	48	48	48	48	48	48	48	48	48
Gallons per hour approximate		15,650	24,450	35,225	47,950	13,650	24,450	35,225	47,950	24,450	35,225	47,950	24,450	35,225	47,050	35,225	47,950
Height in feet water can be raised with 40 lbs. pressure per square inch in cylinder	Non-condensing..	360	230	160	118	456	292	202	149	397	276	202	518	360	264	562	
Ditto ditto	ditto—with Holman's Condenser...	480	307	213	154	603	389	269	198	528	363	269	691	480	352	750	
Ditto ditto	ditto—with Air-pump Condenser...	600	534	267	191	750	486	337	248	660	450	337	864	600	440	937	

PRICES GIVEN ON RECEIPT OF REQUIREMENTS.

Any number of these Engines can be placed side by side, to work in conjunction or separately as desired, thereby multiplying the work of one Pump to any extent.

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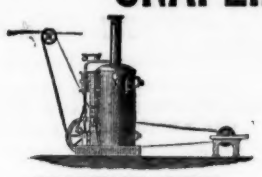
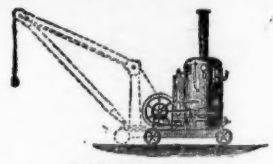
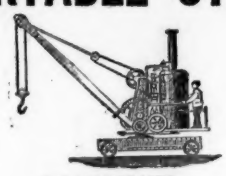


STATIONARY ENGINE. No Building required.

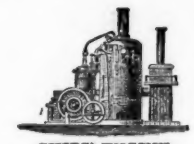


HOISTING ENGINE. With or without Jib.

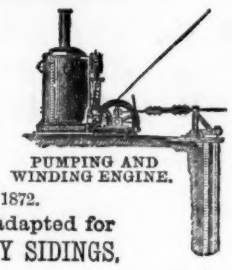


*STEAM CRANE. For Wharf or Rail.

CONTRACTORS' LOCOMOTIVE.



SHIPS' ENGINE AND DISTILLER.



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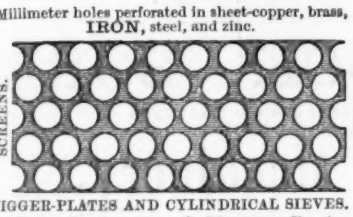

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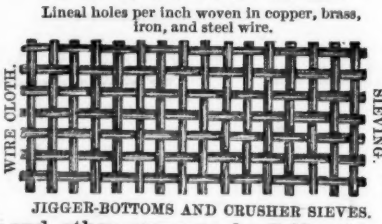

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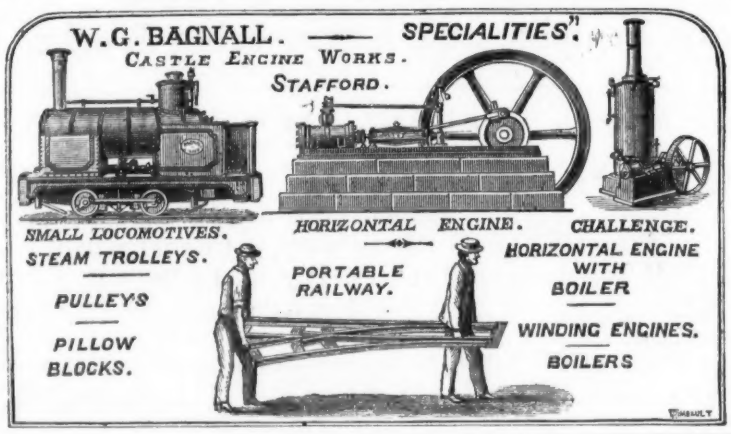

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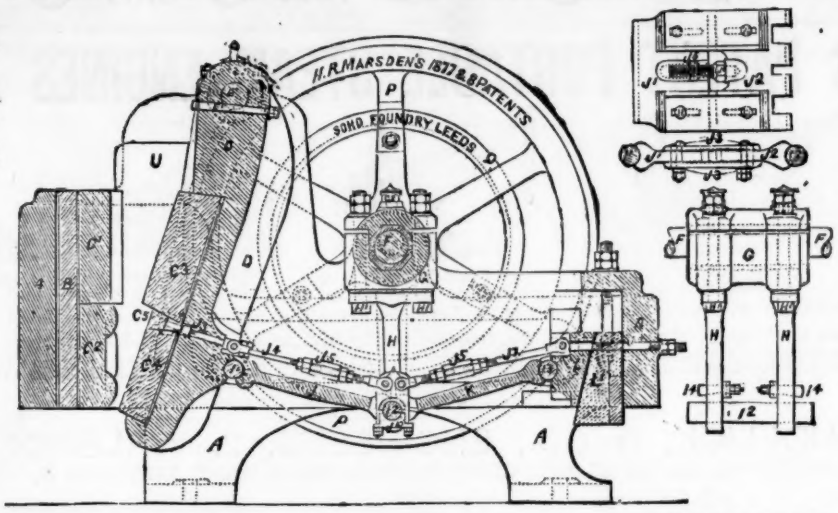

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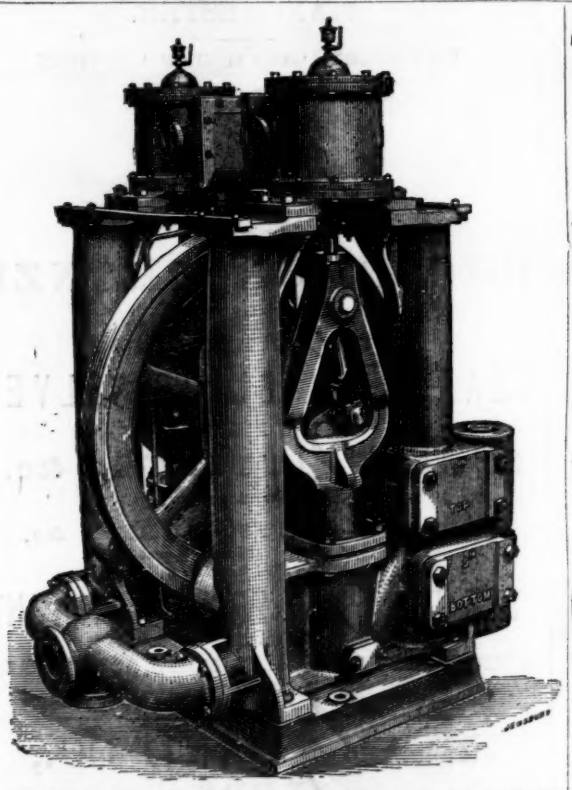

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